

### Question 1

Under the same pressure and temperature conditions, the level of water inside a barometer will be \_\_\_\_\_ than the level of mercury inside the barometer by a factor equal to the ratio of the density of \_\_\_\_\_ over the density of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290048>

### Question 2

The intermolecular forces formed when KI is dissolved in water are \_\_\_\_\_ forces.

Answer: <https://biology-forums.com/index.php?topic=289769>

### Question 3

Which of the following is not explained by Dalton's atomic theory?

- A) conservation of mass during a chemical reaction
- B) the existence of more than one isotope of an element
- C) the law of definite proportions
- D) the law of multiple proportions

Answer: <https://biology-forums.com/index.php?topic=288885>

### Question 4

How many grams of sucrose, C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>, must be added to 500. g of water at 100°C to change the vapor pressure to 752 mm Hg?

- A) 0.295 g
- B) 5.32 g
- C) 10.6 g
- D) 101 g

Answer: <https://biology-forums.com/index.php?topic=290244>

### Question 5

For an octahedral complex what metal d orbitals are directly towards the ligands?

- A) d<sub>xy</sub>, d<sub>xz</sub>
- B) d<sub>xy</sub>, d<sub>xz</sub>, d<sub>yz</sub>
- C) d<sub>z<sup>2</sup></sub>, d<sub>x<sup>2</sup>-y<sup>2</sup></sub>
- D) d<sub>z<sup>2</sup></sub>, d<sub>xz</sub>, d<sub>yz</sub>

Answer: <https://biology-forums.com/index.php?topic=291520>

### Question 6

Which transition could occur if a solid is heated at a pressure below the triple point pressure?

- A) condensation
- B) deposition
- C) melting
- D) sublimation

Answer: <https://biology-forums.com/index.php?topic=290122>

### Question 7

Which element of group 4A has the highest melting point?

- A) C
- B) Si
- C) Sn
- D) Pb

Answer: <https://biology-forums.com/index.php?topic=291750>

### Question 8

Which element has the most favorable (most negative) electron affinity?

- A) K
- B) Be
- C) I
- D) Ne

Answer: <https://biology-forums.com/index.php?topic=289504>

### Question 9

The chemical formula for potassium peroxide is

- A) KOH.
- B) KO<sub>2</sub>.
- C) K<sub>2</sub>O.
- D) K<sub>2</sub>O<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=288921>

### Question 10

How many electrons are in the ion, Zn<sup>2+</sup>?

- A) 28
- B) 30
- C) 32
- D) 65

Answer: <https://biology-forums.com/index.php?topic=288911>

### Question 11

An unknown gas effuses 1.73 times faster than krypton. What is the molar mass of the gas?

- A) 28.0 g/mol
- B) 48.4 g/mol
- C) 110 g/mol
- D) 251 g/mol

Answer: <https://biology-forums.com/index.php?topic=289973>

### Question 12

Potassium hydrogen phthalate (molar mass = 204.2 g/mol) is one of the most commonly used acids for standardizing solutions containing bases. KHP is a monoprotic weak acid with  $K_a = 3.91 \times 10^{-6}$ . Calculate the pH of the solution that results when 0.40 g of KHP is dissolved in enough water to produce 25.0 mL of solution.

- A) 2.10
- B) 3.26
- C) 4.30
- D) 5.41

Answer: <https://biology-forums.com/index.php?topic=290691>

### Question 13

What is the IUPAC name for the continuous carbon chain of C<sub>4</sub>H<sub>10</sub>?

- A) butane
- B) methane
- C) butene
- D) octyne

Answer: <https://biology-forums.com/index.php?topic=292003>

### Question 14

A few sheets of ordinary paper can form an effective shield against what type of radiation?

- A) alpha particles
- B) cosmic rays
- C) gamma rays
- D) neutrons

Answer: <https://biology-forums.com/index.php?topic=291406>

### Question 15

The brown color associated with photochemical smog is due to NO<sub>2</sub>(g), which is involved in an equilibrium with N<sub>2</sub>O<sub>4</sub>(g) in the atmosphere.  
 $2 \text{NO}_2(\text{g}) \rightleftharpoons \text{N}_2\text{O}_4(\text{g})$

Predict the signs of the enthalpy and entropy change for the forward reaction.

- A) The enthalpy change is negative and the entropy change is negative.
- B) The enthalpy change is negative and the entropy change is positive.
- C) The enthalpy change is positive and the entropy change is negative.
- D) The enthalpy change is positive and the entropy change is positive.

Answer: <https://biology-forums.com/index.php?topic=290963>

### Question 16

When 12.0 g of zinc metal reacts with excess HCl, how many liters of H<sub>2</sub> gas are produced at STP?

- A) 0.243 L
- B) 0.486 L
- C) 4.11 L
- D) 8.23 L

Answer: <https://biology-forums.com/index.php?topic=290017>

### Question 17

The pH of 0.255 M HCN is 4.95. What is the value of K<sub>a</sub> for hydrocyanic acid?

- A)  $1.3 \times 10^{-10}$
- B)  $4.9 \times 10^{-10}$
- C)  $1.1 \times 10^{-5}$
- D)  $4.4 \times 10^{-5}$

Answer: <https://biology-forums.com/index.php?topic=290684>

### Question 18

A rad is

- A) the amount of sample that undergoes 1 disintegration per second.
- B) the amount of sample that undergoes  $3.7 \times 10^{10}$  disintegrations per second.
- C) the amount of tissue damage done by radiation.
- D) equal to 0.01 J of energy absorbed per kilogram of tissue.

Answer: <https://biology-forums.com/index.php?topic=291399>

### Question 19

What is the oxidation number of the sulfur atom in Cs<sub>2</sub>SO<sub>3</sub>?

- A) -2
- B) +2
- C) +4
- D) +6

Answer: <https://biology-forums.com/index.php?topic=289320>

### Question 20

Which type of spherical packing has the most unused space?

- A) body-centered cubic
- B) cubic closest-packed
- C) cubic closest-packed and hexagonal closest-packed
- D) simple cubic

Answer: <https://biology-forums.com/index.php?topic=290103>

### Question 21

A sample of pure calcium fluoride with a mass of 15.0 g contains 7.70 g of calcium. How much calcium is contained in 35.0 g of calcium fluoride?

- A) 1.99 g
- B) 7.70 g
- C) 15.0 g
- D) 18.0 g

Answer: <https://biology-forums.com/index.php?topic=288968>

### Question 22

A proton hydrated by ten water molecules has the formula \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290803>

### Question 23

Which of the following compounds is an Arrhenius base?

- A) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
- B) HOCl
- C) H<sub>2</sub>SO<sub>4</sub>
- D) CH<sub>3</sub>NH<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289304>

### Question 24

Which covalent bond is the most polar?

- A) Cl—F
- B) B—F
- C) O—F
- D) F—F

Answer: <https://biology-forums.com/index.php?topic=289736>

### Question 25

Given that O<sub>2</sub> is paramagnetic and has a bond order of 2, and its highest occupied molecular orbital is antibonding, what would be the expected bond orders for O<sub>2</sub><sup>2-</sup> and O<sub>2</sub><sup>2+</sup>?

- A) 1 for O<sub>2</sub><sup>2-</sup> and 3 for O<sub>2</sub><sup>2+</sup>
- B) 3/2 for O<sub>2</sub><sup>2-</sup> and 5/2 for O<sub>2</sub><sup>2+</sup>
- C) 5/2 for O<sub>2</sub><sup>2-</sup> and 3/2 for O<sub>2</sub><sup>2+</sup>
- D) 3 for O<sub>2</sub><sup>2-</sup> and 1 for O<sub>2</sub><sup>2+</sup>

Answer: <https://biology-forums.com/index.php?topic=289699>

### Question 26

If 1.4% of the mass of a human body is calcium, how many kilograms of calcium are there in a 173-pound man?

- A) 1.1 kg Ca
- B) 5.3 kg Ca
- C) 1.1 × 10<sup>2</sup> kg Ca
- D) 5.3 × 10<sup>2</sup> kg Ca

Answer: <https://biology-forums.com/index.php?topic=288770>

### Question 27

An aqueous CsCl solution is 8.00 wt% CsCl and has a density of 1.0643 g/mL at 20°C. What is the boiling point of this solution? K<sub>b</sub> = 0.51°C/m for water.

- A) 100.27°C
- B) 100.53°C
- C) 103.8°C
- D) 104.3°C

Answer: <https://biology-forums.com/index.php?topic=290253>

### Question 28

What is the weight percent of a caffeine solution made by dissolving 4.00 g of caffeine, C<sub>8</sub>H<sub>10</sub>N<sub>4</sub>O<sub>2</sub>, in 75.0 g of benzene, C<sub>6</sub>H<sub>6</sub>?

- A) 0.0506%
- B) 0.0533%
- C) 5.06%
- D) 5.33%

Answer: <https://biology-forums.com/index.php?topic=290214>

### Question 29

What is the mass of 9.00 × 10<sup>22</sup> molecules of NH<sub>3</sub>?

- A) 0.00878 g
- B) 0.393 g
- C) 2.55 g
- D) 114 g

Answer: <https://biology-forums.com/index.php?topic=289134>

### Question 30

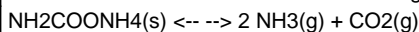
Identify a Group 2A element with the smallest radius.

- A) Na
- B) Ca
- C) Sr
- D) F

Answer: <https://biology-forums.com/index.php?topic=291717>

### Question 31

Ammonium carbamate can dissociate into gases at 25°C according to the reaction:



If sufficient ammonium carbamate is sealed in a flask, the total pressure will be 0.117 atm at equilibrium. What is the value of  $K_p$  at 25°C?

- A)  $2.37 \times 10^{-4}$
- B)  $2.00 \times 10^{-4}$
- C)  $1.60 \times 10^{-3}$
- D)  $3.42 \times 10^{-1}$

Answer: <https://biology-forums.com/index.php?topic=290544>

### Question 32

An ionic compound crystallizes in a unit cell having a face-centered cubic array of metal ions,  $\text{Mn}^+$ , and all of the tetrahedral holes occupied by anions,  $\text{X}^-$ . The empirical formula of this ionic compound is

- A)  $\text{MX}$ .
- B)  $\text{MX}_2$ .
- C)  $\text{M}_2\text{X}$ .
- D)  $\text{M}_7\text{X}_4$ .

Answer: <https://biology-forums.com/index.php?topic=290115>

### Question 33

What is the pH of a solution prepared by mixing 100.00 mL of 0.025 M  $\text{Ca}(\text{OH})_2$  with 50.00 mL of 0.080 M  $\text{LiOH}$ ? Assume that the volumes are additive.

- A) 12.67
- B) 12.78
- C) 12.95
- D) 13.25

Answer: <https://biology-forums.com/index.php?topic=290770>

### Question 34

Calculate the  $K_{sp}$  for silver sulfate if the solubility of  $\text{Ag}_2\text{SO}_4$  in pure water is 4.5 g/L.

- A)  $3.0 \times 10^{-6}$
- B)  $1.2 \times 10^{-5}$
- C)  $2.1 \times 10^{-4}$
- D)  $4.2 \times 10^{-4}$

Answer: <https://biology-forums.com/index.php?topic=290869>

### Question 35

Which of the following best describes  $\text{CO}_2$ ? It has a molecular geometry that is

- A) linear molecular shape with no lone pairs on the I atom.
- B) linear molecular shape with lone pairs on the I atom.
- C) non-linear molecular shape with no lone pairs on the I atom.
- D) non-linear molecular shape with lone pairs on the I atom.

Answer: <https://biology-forums.com/index.php?topic=289666>

### Question 36

Which type of radiation is not used for medical applications?

- A) alpha emission
- B) beta emission
- C) gamma radiation
- D) positron emission

Answer: <https://biology-forums.com/index.php?topic=291405>

### Question 37

Which of the following is not a use of aluminum?

- A) soda cans
- B) cooking pots
- C) cooking utensils
- D) plastic bottles

Answer: <https://biology-forums.com/index.php?topic=291875>

### Question 38

Orange juice is an example of

- A) a compound.
- B) an element.
- C) an ion.
- D) a mixture.

Answer: <https://biology-forums.com/index.php?topic=288990>

### Question 39

What is the mole fraction of I<sub>2</sub> in a solution made by dissolving 27.8 g of I<sub>2</sub> in 260 g of hexane, C<sub>6</sub>H<sub>14</sub>?

- A) 0.0350
- B) 0.965
- C) 1.03
- D) 28.57

Answer: <https://biology-forums.com/index.php?topic=290205>

### Question 40

Alumina-titanium is a composite material used in hip replacements. Composite materials can be classified as ceramic-ceramic, ceramic-metal, or ceramic-polymer. Alumina-titanium is classified as \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291706>

### Question 41

Of the following elements, which has the lowest electronegativity?

- A) Sn
- B) As
- C) S
- D) Tl

Answer: <https://biology-forums.com/index.php?topic=289591>

### Question 42

Which one of the following molecules can rotate freely around its carbon-carbon bond?

- A) benzene
- B) cyclopropane
- C) pentane
- D) ethene

Answer: <https://biology-forums.com/index.php?topic=292008>

### Question 43

Chloroform is a volatile liquid once commonly used in the laboratory but now being phased out due to its ozone depletion potential. If the pressure of gaseous chloroform in a flask is 195 mm Hg at 25°C and its density is 1.25 g/L, what is the molar mass of chloroform?

- A) 10.0 g/mol
- B) 76.3 g/mol
- C) 119 g/mol
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=289948>

### Question 44

A radioisotope which is neutron poor and very heavy is most likely to decay by

- A) alpha emission, electron capture, or positron emission.
- B) only alpha emission.
- C) only electron capture.
- D) only positron emission.

Answer: <https://biology-forums.com/index.php?topic=291352>

### Question 45

Using shorthand notation, the electron configuration of Ni is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289469>

### Question 46

C has a decay constant,  $k = 1.209 \times 10^{-4} \text{ yr}^{-1}$  and a half-life of \_\_\_\_\_ years.

Answer: <https://biology-forums.com/index.php?topic=291462>

### Question 47

What is the pH of a buffer system prepared by dissolving 10.70 grams of  $\text{NH}_4\text{Cl}$  and 30.00 mL of 12 M  $\text{NH}_3$  in enough water to make 1.000 L of solution?  $K_b = 1.80 \times 10^{-5}$  for  $\text{NH}_3$ .

- A) 9.00
- B) 9.26
- C) 9.51
- D) 11.32

Answer: <https://biology-forums.com/index.php?topic=290900>

### Question 48

Identify one mole of a substance.

- A) 32.0 grams of  $\text{H}_2$
- B) 52.0 grams of Cr
- C) 8.0 grams of LiH
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=289158>

### Question 49

What class of compounds are cyclic?

- A) amino acids
- B) lipids
- C) monosaccharides
- D) proteins

Answer: <https://biology-forums.com/index.php?topic=291951>

### Question 50

For the reaction  $2 \text{A} + \text{B}_2 \rightleftharpoons 2 \text{AB}$ , the rate of the forward reaction is 0.75 M/s and the rate of the reverse reaction is 0.25 M/s. The reaction is not at equilibrium. In order to attain equilibrium the reaction must proceed in the \_\_\_\_\_ (forward, reverse) direction in order to achieve equilibrium.

Answer: <https://biology-forums.com/index.php?topic=290617>

### Question 51

Which substance has a larger band gap than silicon?

- A) diamond
- B) copper
- C) germanium
- D) silver

Answer: <https://biology-forums.com/index.php?topic=291626>

### Question 52

The term "nucleons" refers to the number of \_\_\_\_\_ in the atom.

- A) neutrons and electrons
- B) electrons
- C) protons and neutrons
- D) protons and electrons

Answer: <https://biology-forums.com/index.php?topic=291419>

### Question 53

Silicon nitride/zirconia is an example of a

- A) ceramic-ceramic composite.
- B) ceramic-metal composite.
- C) ceramic-polymer composite.
- D) superconductor.

Answer: <https://biology-forums.com/index.php?topic=291652>

### Question 54

What is the pH of a solution made by mixing 30.00 mL of 0.10 M acetic acid with 30.00 mL of 0.10 M KOH? Assume that the volumes of the solutions are additive.  $K_a = 1.8 \times 10^{-5}$  for  $\text{CH}_3\text{CO}_2\text{H}$ .

- A) 5.28
- B) 7.00
- C) 8.72
- D) 10.02

Answer: <https://biology-forums.com/index.php?topic=290858>

### Question 55

The pressure in a container of gas connected to an open-end mercury manometer in which the mercury level is 22 cm lower in the side open to the atmosphere and the atmospheric pressure is 734 mm Hg is \_\_\_\_\_ mm Hg.

Answer: <https://biology-forums.com/index.php?topic=290050>

### Question 56

Metallic character for the main group elements generally

- A) increases from left to right across a period and increases down a group.
- B) increases from left to right across a period and decreases down a group.
- C) decreases from left to right across a period and increases down a group.
- D) decreases from left to right across a period and decreases down a group.

Answer: <https://biology-forums.com/index.php?topic=291710>

### Question 57

What is the weight percent of vitamin C in a solution made by dissolving 8.00 g of vitamin C,  $\text{C}_6\text{H}_8\text{O}_6$ , in 55.0 g of water?

- A) 87.3%
- B) 14.5%
- C) 12.7%
- D) 85.5%

Answer: <https://biology-forums.com/index.php?topic=290213>

### Question 58

Which of these neutralization reactions has a pH = 7 when equal molar amounts of acid and base are mixed?

- A)  $\text{CH}_3\text{CO}_2\text{H}(\text{aq}) + \text{LiOH}(\text{aq}) \rightleftharpoons \text{H}_2\text{O}(\text{l}) + \text{LiCH}_3\text{CO}_2(\text{aq})$
- B)  $\text{HI}(\text{aq}) + \text{C}_5\text{H}_5\text{N}(\text{aq}) \rightleftharpoons \text{C}_5\text{H}_5\text{NH}(\text{aq})$
- C)  $\text{HI}(\text{aq}) + \text{KOH}(\text{aq}) \rightleftharpoons \text{H}_2\text{O}(\text{l}) + \text{KI}(\text{aq})$
- D)  $\text{HNO}_2(\text{aq}) + \text{NH}_3(\text{aq}) \rightleftharpoons \text{NH}_4\text{NO}_2(\text{aq})$

Answer: <https://biology-forums.com/index.php?topic=290890>

### Question 59

A container filled with gas is connected to an open-end U-tube manometer that is filled with mineral oil. The pressure in the gas container is 770 mm Hg and atmospheric pressure is 754 mm Hg. What will be the difference in the levels of mineral oil in the two arms of the manometer if the densities of Hg and mineral oil are 13.6 g/mL and 0.822 g/mL respectively?

- A) 1.15 mm
- B) 15.6 mm
- C) 16.0 mm
- D) 264 mm

Answer: <https://biology-forums.com/index.php?topic=289920>

### Question 60

What is the oxidation state of the Cr atom in  $[\text{Ni}(\text{en})_3][\text{Cr}(\text{CN})_6]_2$ ?

- A) +2
- B) +3
- C) +4
- D) +6

Answer: <https://biology-forums.com/index.php?topic=291508>

### Question 61

A 0.50 m solution of which solute has the largest van't Hoff factor?



- A) CaF<sub>2</sub>
- B) Li<sub>3</sub>PO<sub>4</sub>
- C) K<sub>2</sub>CO<sub>3</sub>
- D) NaNO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290317>

### Question 62

A gas bottle contains 0.800 mol of gas at 730 mm Hg pressure. If the final pressure is 1.15 atm, how many moles of gas were added to the bottle?

- A) 0.0012 mol
- B) 0.158 mol
- C) 0.958 mol
- D) 0.0668 mol

Answer: <https://biology-forums.com/index.php?topic=289928>

### Question 63

In which compound is nitrogen in its lowest possible oxidation state?

- A) NH<sub>3</sub>
- B) N<sub>2</sub>H<sub>4</sub>
- C) HNO<sub>2</sub>
- D) HNO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=291784>

### Question 64

Which group 1A element is not a metal?

- A) H
- B) K
- C) Cs
- D) Be

Answer: <https://biology-forums.com/index.php?topic=288958>

### Question 65

Convert 0.009723 to standard scientific notation.

- A)  $9.723 \times 10^{-3}$
- B)  $9723 \times 10^{-6}$
- C)  $9.723 \times 10^3$
- D)  $9723 \times 10^6$

Answer: <https://biology-forums.com/index.php?topic=288791>

### Question 66

The temperature scales of Kelvin, Celsius, and Fahrenheit use different ways to define scale. Which of the following correctly ranks the temperature from smallest to largest?

- 0°C, 0°F, 0K
- A)  $0\text{K} < 0^\circ\text{C} < 0^\circ\text{F}$
  - B)  $0^\circ\text{C} < 0\text{K} < 0^\circ\text{F}$
  - C)  $0\text{K} < 0^\circ\text{F} < 0^\circ\text{C}$
  - D)  $0^\circ\text{C} = 0\text{K} = 0^\circ\text{F}$

Answer: <https://biology-forums.com/index.php?topic=288753>

### Question 67

Palladium has a face-centered cubic structure and has a density of 12.023 g/cm<sup>3</sup>. What is its atomic radius?

- A) 388 pm
- B) 151 pm
- C) 220 pm
- D) 245 pm

Answer: <https://biology-forums.com/index.php?topic=290106>

### Question 68

Which of the following statements must be true for the entropy of a pure solid to be zero?

- I. The temperature must be 0 K.
- II. The solid must be crystalline, not amorphous.

- III. The solid must be perfectly ordered.  
IV. The solid must be an element.  
A) I  
B) I and II  
C) I, II, and III  
D) I, II, III, and IV

Answer: <https://biology-forums.com/index.php?topic=290975>

### Question 69

A process by which gas molecules escape through a tiny hole in a membrane into a vacuum without collisions is called

- A) Boyle's law.  
B) diffusion.  
C) effusion.  
D) compressibility.

Answer: <https://biology-forums.com/index.php?topic=290041>

### Question 70

Which substance is the best conductor of electricity?

- A) bromine  
B) diamond  
C) tungsten  
D) xenon

Answer: <https://biology-forums.com/index.php?topic=291673>

### Question 71

Which one of the following amino acids does not contain a basic side chain?

- A) arginine  
B) histidine  
C) lysine  
D) glutamine

Answer: <https://biology-forums.com/index.php?topic=292020>

### Question 72

Which one of the following amino acids contains a hydrophobic side chain?

- A) leucine  
B) cysteine  
C) glutamine  
D) lysine

Answer: <https://biology-forums.com/index.php?topic=292039>

### Question 73

How many electrons does barium lose and nitrogen need to form Ba<sub>3</sub>P<sub>2</sub>?

- A) barium loses 2 and phosphorus gains 2  
B) barium loses 2 and phosphorus gains 3  
C) barium loses 3 and phosphorus gains 2  
D) barium loses 3 and phosphorus gains 3

Answer: <https://biology-forums.com/index.php?topic=289551>

### Question 74

Which of the following has the greatest mass?

- A)  $1.55 \times 10^{23}$  molecules of O<sub>2</sub>  
B) 4.00 g of O<sub>2</sub>  
C) 0.125 mol of O<sub>2</sub>  
D) All of these have the same mass.

Answer: <https://biology-forums.com/index.php?topic=289143>

### Question 75

The number of orbitals having the quantum numbers,  $n = 5$  and  $l = 3$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289462>

### Question 76

The density of mercury is 13.6 g/cm<sup>3</sup>. The mass of 38.0 cm<sup>3</sup> of mercury is \_\_\_\_\_ g.

Answer: <https://biology-forums.com/index.php?topic=288854>

### Question 77

If the number of moles of gas is halved at constant temperature and volume, the pressure of the gas

- A) is doubled.
- B) is halved.
- C) is one-fifth.
- D) remains the same.

Answer: <https://biology-forums.com/index.php?topic=290010>

### Question 78

What is the pH of a 0.040 M HClO<sub>4</sub> solution?

- A) 0.040
- B) 0.080
- C) 1.40
- D) 12.60

Answer: <https://biology-forums.com/index.php?topic=290761>

### Question 79

Round off 00507506 to four significant figures.

- A) 0051
- B) 5076
- C) 5100
- D)  $5.075 \times 10^5$

Answer: <https://biology-forums.com/index.php?topic=288834>

### Question 80

In the most acceptable electron-dot structure for carbonyl fluoride, COF<sub>2</sub> the central atom is

- A) C, which is singly-bonded to O.
- B) C, which is doubly-bonded to O.
- C) O, which is singly-bonded to C.
- D) O, which is doubly-bonded to C.

Answer: <https://biology-forums.com/index.php?topic=289609>

### Question 81

Molarity is defined as

- A) moles of solute per liter of solution.
- B) moles of solute per liter of solvent.
- C) moles of solvent per liter of solution.
- D) moles of solvent per liter of solvent.

Answer: <https://biology-forums.com/index.php?topic=289205>

### Question 82

What is the Celsius temperature of 100.0 g of chlorine gas in a 4.00-L container at 800 mm Hg?

- A) 309°C
- B) -236°C
- C) 236°C
- D) -309°C

Answer: <https://biology-forums.com/index.php?topic=289943>

### Question 83

Which of the following is an allotrope of carbon?

- A) diamond
- B) glass
- C) coal
- D) carbon monoxide

Answer: <https://biology-forums.com/index.php?topic=290163>

### Question 84

Which statement concerning any homonuclear diatomic molecule and its 1- ion must be true?

- A) X<sub>2</sub> must be more stable than X<sub>2</sub><sup>-</sup>.
- B) X<sub>2</sub> must be less stable than X<sub>2</sub><sup>-</sup>.
- C) X<sub>2</sub><sup>-</sup> must be paramagnetic and X<sub>2</sub> must be diamagnetic.
- D) X<sub>2</sub><sup>-</sup> must be paramagnetic and X<sub>2</sub> may be paramagnetic or diamagnetic.

Answer: <https://biology-forums.com/index.php?topic=289701>

### Question 85

Which is a net ionic equation for the neutralization reaction of a strong acid with a weak base?

- A) HF(aq) + LiOH(aq) <-- --> H<sub>2</sub>O(l) + LiF(aq)
- B) H<sub>3</sub>O<sup>+</sup>(aq) + OH<sup>-</sup>(aq) <-- --> 2 H<sub>2</sub>O(l)
- C) HI(aq) + NH<sub>3</sub>(aq) <-- --> NH<sub>4</sub>I(aq)
- D) H<sub>3</sub>O<sup>+</sup>(aq) + NH<sub>3</sub>(aq) <-- --> NH<sub>4</sub><sup>+</sup>(aq) + H<sub>2</sub>O(l)

Answer: <https://biology-forums.com/index.php?topic=290885>

### Question 86

Tin exists in two forms: gray tin and white tin. The electrical conductivity of gray tin increases with an increase in temperature, whereas the electrical conductivity of white tin decreases with an increase in temperature. The form of tin that is a semiconductor is \_\_\_\_\_ tin.

Answer: <https://biology-forums.com/index.php?topic=291693>

### Question 87

How many grams of KNO<sub>3</sub> are needed to make 250. mL of a solution that is 0.135 M?

- A) 1.71 g
- B) 0.341 g
- C) 3.41 g
- D) 6.82 g

Answer: <https://biology-forums.com/index.php?topic=289207>

### Question 88

Under thermodynamic standard state conditions the element oxygen occurs as

- A) O(g)
- B) O<sub>2</sub>(g)
- C) O<sub>2</sub>(l)
- D) O<sub>3</sub>(g)

Answer: <https://biology-forums.com/index.php?topic=289790>

### Question 89

What statement is not representative of the chemistry of H<sub>2</sub>S?

- A) It has a tetrahedral geometry.
- B) It is an extremely toxic substance.
- C) It is a weak diprotic acid.
- D) It is a weak reducing agent.

Answer: <https://biology-forums.com/index.php?topic=291900>

### Question 90

A banana split is an example of

- A) a compound.
- B) an element.
- C) a mixture.
- D) an ion.

Answer: <https://biology-forums.com/index.php?topic=288985>

### Question 91

The rate constant, k, for a first-order reaction is equal to 4.2 × 10<sup>-4</sup> s<sup>-1</sup>. What is the half-life for the reaction?

- A) 2.9 × 10<sup>-4</sup> s
- B) 1.2 × 10<sup>3</sup> s

C)  $1.7 \times 10^3$  s

D)  $2.4 \times 10^3$  s

Answer: <https://biology-forums.com/index.php?topic=290376>

### Question 92

What is the name of the commercial process for the preparation of sulfuric acid?

A) Contact process

B) Haber process

C) Mond process

D) Ostwald process

Answer: <https://biology-forums.com/index.php?topic=291821>

### Question 93

A reaction in which reactants form products in the forward reaction and products simultaneously form reactants in the reverse reaction is said to be \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290602>

### Question 94

If the pressure in a gas container that is connected to an open-end U-tube manometer is 126 kPa and the pressure of the atmosphere at the open end of the tube is 732 mm Hg, the level of mercury in the tube will

A) be 213 mm higher in the arm open to the atmosphere.

B) be 213 mm higher in the arm connected to the gas cylinder.

C) be 945 mm higher in the arm open to the atmosphere.

D) be 945 mm higher in the arm connected to the gas cylinder.

Answer: <https://biology-forums.com/index.php?topic=289988>

### Question 95

Which one of the following compounds contains ionic bonds?

A) MgS

B) HF

C) NCl<sub>3</sub>

D) SiO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289025>

### Question 96

A single sp<sup>3</sup> hybrid orbital has

A) one lobe.

B) two lobes of equal size.

C) two lobes of unequal size.

D) three lobes of equal size.

Answer: <https://biology-forums.com/index.php?topic=289733>

### Question 97

The equilibrium constant, K, can be calculated from

A) E°.

B) E.

C) either E° or E.

D) neither E° nor E.

Answer: <https://biology-forums.com/index.php?topic=291145>

### Question 98

An automobile uses gasoline at a rate of 35 mi/gal, which is the same as \_\_\_\_\_ km/L (1 km = 0.6214 mi, 1 gal = 3.78 L).

A) 5.8

B) 15

C) 82

D) 210

Answer: <https://biology-forums.com/index.php?topic=288769>

### Question 99

The number of Lewis electron dot resonance structures required to describe  $\text{NO}_2^-$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289660>

### Question 100

Which of the following would have a density of 3.04 g/L at 7.0°C and 0.987 atm?

- A) Ar
- B)  $\text{Cl}_2$
- C) He
- D)  $\text{N}_2$

Answer: <https://biology-forums.com/index.php?topic=290014>

### Question 101

In a flask containing 2.00 mol of Ar, 3.00 mol of HCN, and 5.00 mol of  $\text{N}_2$  at STP the partial pressure of He is \_\_\_\_\_ mm Hg.

Answer: <https://biology-forums.com/index.php?topic=290060>

### Question 102

The nighttime and daytime temperatures on Mercury are 13 K and 683 K respectively. The melting point and boiling point of sulfur is 246°F and 832°F.

Which of the following statements is true? On Mercury sulfur exists

- A) only in the liquid state.
- B) only in the solid state.
- C) as both a liquid and a gas.
- D) as both a liquid and a solid.

Answer: <https://biology-forums.com/index.php?topic=288751>

### Question 103

Which ionic compound would be expected to have the highest lattice energy?

- A)  $\text{Li}_2\text{O}$
- B)  $\text{Na}_2\text{O}_2$
- C)  $\text{KO}_2$
- D)  $\text{RbO}_2$

Answer: <https://biology-forums.com/index.php?topic=289518>

### Question 104

Water has an unusually high

- A) electrical conductivity.
- B) heat of combustion.
- C) heat of formation.
- D) specific heat.

Answer: <https://biology-forums.com/index.php?topic=289809>

### Question 105

According to the kinetic molecular theory of gases, raising the temperature of a gases increases the average kinetic energy and the frequency of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290065>

### Question 106

The electronegativity is 2.1 for H and 1.9 for Sb. Based on these electronegativities  $\text{SbH}_3$  would be expected to

- A) be ionic and contain  $\text{H}^-$  ions.
- B) be ionic and contain  $\text{H}^+$  ions.
- C) have polar covalent bonds with a partial negative charges on the H atoms.
- D) have polar covalent bonds with a partial positive charges on the H atoms.

Answer: <https://biology-forums.com/index.php?topic=289625>

### Question 107

What is the common ion in a solution prepared by mixing 0.55 M  $\text{LiCH}_3\text{CO}_2$  with 0.10 M  $\text{CH}_3\text{CO}_2\text{H}$ ?

- A)  $\text{H}_3\text{O}^+$
- B)  $\text{Li}^+$
- C)  $\text{CH}_3\text{CO}_2^-$
- D)  $\text{OH}^-$

Answer: <https://biology-forums.com/index.php?topic=290897>

### Question 108

Arrange in order from the smallest to the largest bond angle:  $\text{CCl}_3^+$ ,  $\text{NF}_3$ ,  $\text{NH}_4^+$ ,  $\text{XeBr}_4$ .

- A)  $\text{CCl}_3^+$ ,  $\text{NF}_3$ ,  $\text{NH}_4^+$ ,  $\text{XeBr}_4$
- B)  $\text{NF}_3$ ,  $\text{NH}_4^+$ ,  $\text{XeBr}_4$ ,  $\text{CCl}_3^+$
- C)  $\text{XeBr}_4$ ,  $\text{NH}_4^+$ ,  $\text{NF}_3$ ,  $\text{CCl}_3^+$
- D)  $\text{XeBr}_4$ ,  $\text{NF}_3$ ,  $\text{NH}_4^+$ ,  $\text{CCl}_3^+$

Answer: <https://biology-forums.com/index.php?topic=289729>

### Question 109

What is the chemical symbol for thallium?

- A) Ti
- B) Tl
- C) Tm
- D) Th

Answer: <https://biology-forums.com/index.php?topic=288932>

### Question 110

What are the possible values of  $l$  if  $n = 3$ ?

- A) 3
- B) 0, 1, or 2
- C) -4, -3, -2, -1, 0, +1, +2, +3, or +4
- D) -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, or +5

Answer: <https://biology-forums.com/index.php?topic=289420>

### Question 111

A mixture of carbon monoxide, hydrogen, and methanol is at equilibrium. The balanced chemical equation is:  $\text{CO}(\text{g}) + 2 \text{H}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g})$ . At  $250^\circ\text{C}$ , the mixture contains  $0.0960 \text{ M CO}$ ,  $0.191 \text{ M H}_2$ , and  $0.150 \text{ M CH}_3\text{OH}$ . What is the value for  $K_c$ ?

- A)  $2.33 \times 10^{-2}$
- B) 0.244
- C) 4.09
- D) 42.8

Answer: <https://biology-forums.com/index.php?topic=290491>

### Question 112

The orbital hybridization on the central carbon atom in  $\text{CH}_3\text{CCH}$  is

- A)  $sp$ .
- B)  $sp^2$ .
- C)  $sp^3$ .
- D)  $sp^4$ .

Answer: <https://biology-forums.com/index.php?topic=289675>

### Question 113

For a spontaneous process

- A) energy and entropy are conserved.
- B) energy is conserved and the entropy of the system and surroundings increases.
- C) the energy of the system and the surroundings decreases and the entropy of the system and surroundings increases.
- D) both the energy and the entropy of the system and surroundings decrease.

Answer: <https://biology-forums.com/index.php?topic=290982>

### Question 114

The first vibrational level for  $\text{NaH}$  lies at  $1.154 \times 10^{-20} \text{ J}$  and the second vibrational level lies at  $1.742 \times 10^{-20} \text{ J}$ . What is the frequency of the photon emitted when a molecule of  $\text{NaH}$  drops from the second vibrational level to the first vibrational level?

- A)  $1.742 \times 10^{13} \text{ Hz}$
- B)  $3.399 \times 10^{13} \text{ Hz}$
- C)  $5.140 \times 10^{13} \text{ Hz}$
- D)  $6.882 \times 10^{13} \text{ Hz}$

Answer: <https://biology-forums.com/index.php?topic=289392>

### Question 115

Two moles of neon gas at 20.0°C are heated to 350°C while the volume is kept constant. The density of the gas

- A) decreases.
- B) increases.
- C) remains the same.
- D) Not enough information was given to answer the question.

Answer: <https://biology-forums.com/index.php?topic=289956>

### Question 116

The structure of a solid can be determined by diffraction of radiation in which region of the electromagnetic radiation spectrum?

- A) infrared
- B) microwave
- C) visible
- D) X-ray

Answer: <https://biology-forums.com/index.php?topic=290098>

### Question 117

Which represents one formula unit?

- A) One Cu
- B) One F<sub>2</sub>
- C) One NaH
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=289157>

### Question 118

The Lewis electron-dot structure of H<sub>2</sub>CO has \_\_\_\_\_ nonbonding electron pairs, \_\_\_\_\_ bonding electron pairs, and a carbon-oxygen bond order of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289658>

### Question 119

Nonoxide ceramics include silicon nitride, the formula of which is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291703>

### Question 120

The equilibrium constant  $K_c$  for the reaction  $\text{HF}(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{H}_3\text{O}^+(\text{aq}) + \text{F}^-(\text{aq})$  is  $3.5 \times 10^{-4}$ . What is the equilibrium concentration of  $\text{H}_3\text{O}^+$  if the initial concentration of HF is 1.0 M?

- A) 1.0 M
- B)  $3.5 \times 10^{-2}$  M
- C)  $1.9 \times 10^{-2}$  M
- D)  $1.9 \times 10^{-4}$  M

Answer: <https://biology-forums.com/index.php?topic=290547>

### Question 121

Addition of 0.0125 mol KOH to 150 mL of a 0.150 M formic acid/0.100 M sodium formate buffer results in a pH = \_\_\_\_\_. The  $K_a$  of formic acid is  $1.8 \times 10^{-4}$ .

Answer: <https://biology-forums.com/index.php?topic=290941>

### Question 122

Chlorine has two common isotopes, chlorine-35 and chlorine-37, and an atomic mass of 35.45 amu. The natural abundance of chlorine-35 is \_\_\_\_\_ (greater than, less than, the same as) the natural abundance of chlorine-37.

Answer: <https://biology-forums.com/index.php?topic=289055>

### Question 123

What is the concentration of HCl in the final solution when 65 mL of a 6.0 M HCl solution is diluted with pure water to a total volume of 0.15 L?

- A)  $1.4 \times 10^{-2}$  M
- B) 2.6 M
- C) 14 M
- D)  $2.6 \times 10^3$  M



Answer: <https://biology-forums.com/index.php?topic=289282>

### Question 124

What is the pH of a solution prepared by diluting 25.00 mL of 0.10 M HCl with enough water to produce a total volume of 100.00 mL?

- A) 1.00
- B) 1.60
- C) 2.00
- D) 3.20

Answer: <https://biology-forums.com/index.php?topic=290675>

### Question 125

The best oxidizing agents are found at the \_\_\_\_\_ of the activity series.

Answer: <https://biology-forums.com/index.php?topic=289356>

### Question 126

Name the product obtained from the addition of chlorine to 3-methyl-1-octene.

- A) 1, 1-dichlorooctane
- B) 1, 2-dichloro-3-methylbutane
- C) 1, 2-dichlorononane
- D) trans-1, 2-dichlorooctene

Answer: <https://biology-forums.com/index.php?topic=292010>

### Question 127

What is the pH of a 0.20 M H<sub>2</sub>Se solution that has the stepwise dissociation constants  $K_{a1} = 1.3 \times 10^{-4}$  and  $K_{a2} = 1.0 \times 10^{-11}$ ?

- A) 2.29
- B) 3.89
- C) 4.59
- D) 5.57

Answer: <https://biology-forums.com/index.php?topic=290779>

### Question 128

Classify bonds in BeS as largely ionic, nonpolar covalent, or polar covalent.

Answer: <https://biology-forums.com/index.php?topic=289651>

### Question 129

Which group of elements are found as diatomic molecules?

- A) alkali metals
- B) alkaline earth metals
- C) halogens
- D) noble gases

Answer: <https://biology-forums.com/index.php?topic=291824>

### Question 130

Of the following, which atom has the smallest atomic radius?

- A) K
- B) As
- C) Rb
- D) Sb

Answer: <https://biology-forums.com/index.php?topic=289448>

### Question 131

According to band theory, which one of the following metals is expected to have the highest melting point?

- A) Cd
- B) Cr
- C) Hg
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291619>

### Question 132

How many cations are in 0.500 g of  $\text{MgBr}_2$ ?

- A)  $1.37 \times 10^{21}$  anions
- B)  $1.64 \times 10^{21}$  anions
- C)  $2.22 \times 10^{26}$  anions
- D)  $4.43 \times 10^{26}$  anions

Answer: <https://biology-forums.com/index.php?topic=289089>

### Question 133

The compound  $\text{CCl}_4$  contains

- A) ionic bonds.
- B) nonpolar covalent bonds.
- C) polar covalent bonds, with partial negative charges on the Cl atoms.
- D) polar covalent bonds, with partial negative charges on the C atoms.

Answer: <https://biology-forums.com/index.php?topic=289594>

### Question 134

Calculate the pH for an aqueous solution of acetic acid that contains  $2.15 \times 10^{-3}$  M hydronium ion.

- A)  $4.65 \times 10^{-12}$
- B)  $2.15 \times 10^{-3}$
- C) 2.67
- D) 11.33

Answer: <https://biology-forums.com/index.php?topic=290659>

### Question 135

Which horizontal row of the periodic table contains the most elements?

- A) row 4
- B) row 5
- C) row 6
- D) They all contain the same number of elements.

Answer: <https://biology-forums.com/index.php?topic=288870>

### Question 136

The ion  $\text{NO}_2^-$  is named

- A) nitrate ion.
- B) nitrite ion.
- C) nitrogen dioxide ion.
- D) nitrogen(II) oxide ion.

Answer: <https://biology-forums.com/index.php?topic=288925>

### Question 137

How many lone pairs of electrons are on the N atom in  $\text{NBr}_3$ ?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289634>

### Question 138

When KI is dissolved in water, the major forces overcome are \_\_\_\_\_ forces in the solute and \_\_\_\_\_ forces in the solvent, and the major forces created between solute and solvent particles are \_\_\_\_\_ forces.

Answer: <https://biology-forums.com/index.php?topic=290325>

### Question 139

When  $\text{Na}_2\text{CrO}_4(\text{aq})$  and  $\text{AgNO}_3(\text{aq})$  are mixed, a red colored precipitate forms which is

- A) Ag.
- B)  $\text{Ag}_2\text{CrO}_4$ .
- C)  $\text{AgNO}_2$ .
- D)  $\text{NaNO}_3$ .

Answer: <https://biology-forums.com/index.php?topic=289223>

### Question 140

Chromium crystallizes in a body-centered cubic structure. What is the coordination number of each atom?

- A) 4
- B) 6
- C) 8
- D) 12

Answer: <https://biology-forums.com/index.php?topic=290110>

### Question 141

A 0.50 M  $\text{KNO}_2$  solution will have a pH \_\_\_\_\_ seven.

Answer: <https://biology-forums.com/index.php?topic=290822>

### Question 142

A motorcycle emits 9.5 g of carbon monoxide per kilometer driven. How many pounds of carbon monoxide does the motorcycle generate over 5.0 years if the motorcycle is driven 15,000 miles per year?

- A)  $8.9 \times 10^1$  lb CO
- B)  $9.8 \times 10^2$  lb CO
- C)  $2.5 \times 10^3$  lb CO
- D)  $2.3 \times 10^4$  lb CO

Answer: <https://biology-forums.com/index.php?topic=288777>

### Question 143

What are two of the major components of stainless steel?

- A) iron and carbon
- B) iron and chromium
- C) iron and titanium
- D) iron and tungsten

Answer: <https://biology-forums.com/index.php?topic=291501>

### Question 144

Transition series elements are all

- A) gases.
- B) metals.
- C) nonmetals.
- D) semimetals.

Answer: <https://biology-forums.com/index.php?topic=291486>

### Question 145

What is the concentration of 200. mL of 0.500 M  $\text{LiF}$ ?

- A) 0.500 M
- B) 1.00 M
- C) 0.250 M
- D) 0.400 M

Answer: <https://biology-forums.com/index.php?topic=289281>

### Question 146

An orbital with  $n = 5$  and  $l = 2$  is a \_\_\_\_\_ orbital.

Answer: <https://biology-forums.com/index.php?topic=289461>

### Question 147

Positron emission changes the atomic number of an element by

- A) -2.
- B) -1.
- C) +1.
- D) +2.

Answer: <https://biology-forums.com/index.php?topic=291335>

### Question 148

Which substance is the best conductor of electricity?

- A) diamond
- B) germanium
- C) gold
- D) phosphorus

Answer: <https://biology-forums.com/index.php?topic=291618>

### Question 149

What is the most metallic element of group 4A?

- A) Ge
- B) Sb
- C) Sn
- D) Pb

Answer: <https://biology-forums.com/index.php?topic=291848>

### Question 150

What is the entropy of 12 molecules in a system of 100 boxes?

Answer: <https://biology-forums.com/index.php?topic=291054>

### Question 151

Of  $C_2H_5OH$  and  $C_3H_5(OH)_3$  the one expected to have the higher vapor pressure is \_\_\_\_\_, and the one expected to have the higher boiling point is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290171>

### Question 152

Of the following, which element has the highest first ionization energy?

- A) Cl
- B) F
- C) O
- D) S

Answer: <https://biology-forums.com/index.php?topic=289489>

### Question 153

How many milliliters of a 9.0 M  $H_2SO_4$  solution are needed to make 0.45 L of a 3.5 M solution?

- A) 0.18 mL
- B) 1.2 mL
- C) 180 mL
- D) 1200 mL

Answer: <https://biology-forums.com/index.php?topic=289283>

### Question 154

The chemical formula for the nitrite ion is

- A)  $N_2^-$ .
- B)  $N_3^-$ .
- C)  $NO_2^-$ .
- D)  $NO_3^-$ .

Answer: <https://biology-forums.com/index.php?topic=289014>

### Question 155

What is the pH of the resulting solution if 40.00 mL of 0.10 M acetic acid is added to 10.00 mL of 0.10 M NaOH? Assume that the volumes of the solutions are additive.  $K_a = 1.8 \times 10^{-5}$  for  $CH_3CO_2H$ .

- A) 9.73
- B) 8.78
- C) 5.22
- D) 4.27

Answer: <https://biology-forums.com/index.php?topic=290908>

### Question 156

In which case should  $CO_2(g)$  be more soluble in water?

- A) The total pressure is 5 atm and the partial pressure of CO<sub>2</sub> is 0.4 atm.  
B) The total pressure is 3 atm and the partial pressure of CO<sub>2</sub> is 0.6 atm.  
C) The total pressure is 1 atm and the partial pressure of CO<sub>2</sub> is 0.3 atm.  
D) The total pressure is 1 atm and the partial pressure of CO<sub>2</sub> is 0.5 atm.

Answer: <https://biology-forums.com/index.php?topic=290302>

### Question 157

Which of the following compounds is not an Arrhenius acid?

- A) CH<sub>3</sub>CO<sub>2</sub>H  
B) C<sub>3</sub>H<sub>7</sub>NH<sub>2</sub>  
C) HNO<sub>2</sub>  
D) H<sub>2</sub>SO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289303>

### Question 158

How many electrons are in the outermost shell of the Al<sup>3+</sup> ion in its ground state?

- A) 2  
B) 3  
C) 6  
D) 8

Answer: <https://biology-forums.com/index.php?topic=289525>

### Question 159

Radon belongs to the \_\_\_\_\_ group of the periodic table.

- A) alkali metal  
B) alkaline earth metal  
C) halogen  
D) noble gas

Answer: <https://biology-forums.com/index.php?topic=288947>

### Question 160

The neutral atom with the electron configuration [Ar]4s<sup>2</sup>3d<sup>6</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289567>

### Question 161

An equilibrium mixture of CO, O<sub>2</sub> and CO<sub>2</sub> at a certain temperature contains 0.0010 M CO<sub>2</sub> and 0.0015 M O<sub>2</sub>. At this temperature, K<sub>c</sub>, equals 1.4 × 10<sup>2</sup> for the reaction:



What is the equilibrium concentration of CO?

- A) 4.8 × 10<sup>-6</sup> M  
B) 2.2 × 10<sup>-3</sup> M  
C) 9.3 × 10<sup>-2</sup> M  
D) 3.1 × 10<sup>-1</sup> M

Answer: <https://biology-forums.com/index.php?topic=290524>

### Question 162

The SI unit for pressure is the

- A) atmosphere.  
B) MM Hg.  
C) newton.  
D) pascal.

Answer: <https://biology-forums.com/index.php?topic=289913>

### Question 163

An "empty" aerosol can at 25°C still contains gas at 1.00 atmosphere pressure. If an "empty" can is thrown into a 450°C fire, what is the final pressure in the heated can?

- A) 5.56 × 10<sup>-2</sup> atm  
B) 0.413 atm  
C) 2.42 atm  
D) 18.0 atm

Answer: <https://biology-forums.com/index.php?topic=289998>

### Question 164

What is the pH of 1 L of 0.30 M TRIS, 0.60 M TRISH<sup>+</sup> buffer to which one has added 5.0 mL of 12 M HCl? The  $K_b$  for the TRIS/TRISH<sup>+</sup> is  $1.2 \times 10^{-6}$ .

- A) 5.92
- B) 6.36
- C) 7.36
- D) 7.64

Answer: <https://biology-forums.com/index.php?topic=290836>

### Question 165

According to band theory, which of the following metals is expected to have the strongest bonding and highest melting point?

- A) Cs
- B) Cu
- C) Rb
- D) Ru

Answer: <https://biology-forums.com/index.php?topic=291620>

### Question 166

How many grams of chromium metal are plated out when a constant current of 8.00 A is passed through an aqueous solution containing  $\text{Cr}^{3+}$  ions for 160. minutes?

- A) 13.8 g
- B) 24.6 g
- C) 41.2 g
- D) 124 g

Answer: <https://biology-forums.com/index.php?topic=291242>

### Question 167

A sample of pure calcium fluoride with a mass of 15.0 g contains 7.70 g of calcium. How much calcium is contained in 45.0 g of calcium fluoride?

- A) 2.56 g
- B) 7.70 g
- C) 15.0 g
- D) 23.1 g

Answer: <https://biology-forums.com/index.php?topic=288881>

### Question 168

A reaction is performed in a 1-L balloon at 25°C and 1 atm pressure. At the end of the reaction the balloon has expanded to 1.5 L and the surface of the balloon has a temperature of 35°C and is at 1 atm pressure. Determine whether the signs of the heat transferred, the work, and the energy change, respectively, are positive or negative.

Answer: <https://biology-forums.com/index.php?topic=289901>

### Question 169

Which element has the ground-state electron configuration  $[\text{Xe}]6s^25f^4$ ?

- A) Pr
- B) Nd
- C) Pm
- D) Sm

Answer: <https://biology-forums.com/index.php?topic=289406>

### Question 170

The dissociation equilibrium constants for the protonated form of alanine (a diprotic amino acid,  $\text{H}_2\text{X}^+$ ) are  $K_{a1} = 4.6 \times 10^{-3}$  and  $K_{a2} = 2.0 \times 10^{-10}$ . What is the pH of 50.00 mL of a 0.050 M solution of alanine after 37.50 mL of 0.100 M NaOH has been added?

- A) 4.85
- B) 6.02
- C) 7.39
- D) 9.70

Answer: <https://biology-forums.com/index.php?topic=290867>

### Question 171

For which of the following will the entropy of the system increase?

- A) condensation of steam
- B) reaction of zinc with oxygen to form zinc oxide
- C) reaction of nitrogen and hydrogen to form ammonia
- D) sublimation of dry ice

Answer: <https://biology-forums.com/index.php?topic=291022>

### Question 172

The chemical formula for chlorous acid is

- A)  $\text{HClO}(\text{aq})$ .
- B)  $\text{HClO}_2(\text{aq})$ .
- C)  $\text{HClO}_3(\text{aq})$ .
- D)  $\text{HClO}_4(\text{aq})$ .

Answer: <https://biology-forums.com/index.php?topic=289019>

### Question 173

The volume of 0.200 M  $\text{H}_2\text{SO}_4$  that contains 5.00 mmol of  $\text{H}^+$  is \_\_\_\_\_ mL.

Answer: <https://biology-forums.com/index.php?topic=290330>

### Question 174

What is the mass of 0.0500 mol of dichlorodifluoromethane,  $\text{CF}_2\text{Cl}_2$ ?

- A)  $4.14 \times 10^{-4}$  g
- B) 6.05 g
- C) 12.1 g
- D) 24.2 g

Answer: <https://biology-forums.com/index.php?topic=289081>

### Question 175

What is a cermet?

- A) boron nitride/epoxy
- B) ceramic-metal composite
- C) ceramic-polymer composite
- D) silicon carbide/graphite

Answer: <https://biology-forums.com/index.php?topic=291651>

### Question 176

What is the  $[\text{CH}_3\text{CO}_2^-]/[\text{CH}_3\text{CO}_2\text{H}]$  ratio necessary to make a buffer solution with a pH of 4.24?  $K_a = 1.8 \times 10^{-5}$  for  $\text{CH}_3\text{CO}_2\text{H}$ .

- A) 0.31:1
- B) 0.89:1
- C) 1.1:1
- D) 3.2:1

Answer: <https://biology-forums.com/index.php?topic=290901>

### Question 177

Which of the following atoms with the specified electronic configurations would have the lowest first ionization energy?

- A)  $[\text{He}]2s^22p^3$
- B)  $[\text{Ne}]3s^23p^4$
- C)  $[\text{Xe}]6s^1$
- D)  $[\text{Xe}]6s^24f^{14}5d^{10}6p^1$

Answer: <https://biology-forums.com/index.php?topic=289494>

### Question 178

Which one of the following amino acids contains a basic side chain?

- A) proline
- B) cytosine
- C) glutamic acid
- D) arginine

Answer: <https://biology-forums.com/index.php?topic=292032>

### Question 179

Calculate the kinetic energy of a 150-g baseball moving at a speed of 40. m/s (89 mph).

- A) 6.0 J
- B)  $1.2 \times 10^2$  J
- C)  $6.0 \times 10^3$  J
- D)  $1.2 \times 10^5$  J

Answer: <https://biology-forums.com/index.php?topic=288765>

### Question 180

Radiation is detected by its \_\_\_\_\_ properties.

- A) gravitational
- B) ionizing
- C) kinetic
- D) thermal

Answer: <https://biology-forums.com/index.php?topic=291392>

### Question 181

The highest oxidation state attainable by Zn is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291589>

### Question 182

Which one of the following elements can form more than four bonds with other elements?

- A) C
- B) O
- C) F
- D) P

Answer: <https://biology-forums.com/index.php?topic=291851>

### Question 183

Which one of the following carbides is not a correct formula?

- A)  $\text{CaC}_2$
- B)  $\text{Fe}_3\text{C}$
- C)  $\text{SiC}$
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=291774>

### Question 184

Which is the crystal field energy level diagram for a square pyramidal  $\text{ML}_5$  complex that contains a single ligand on the z-axis?

- A) (A)
- B) (B)
- C) (C)
- D) (D)

Answer: <https://biology-forums.com/index.php?topic=291542>

### Question 185

When the equation for the reaction of  $\text{KBr}(\text{aq})$  with  $\text{MnO}_2(\text{s})$  to produce  $\text{Br}_2$  and  $\text{Mn}^{2+}(\text{aq})$  in acidic solution is balanced, the coefficient in front of the  $\text{Br}_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291932>

### Question 186

A balanced equation has the same numbers and kinds of \_\_\_\_\_ on both sides of the reaction arrow.

Answer: <https://biology-forums.com/index.php?topic=289186>

### Question 187

Which of the following can function as a bidentate ligand?

- A) sulfide
- B) hydroxide
- C) oxalate



D) fluoride

Answer: <https://biology-forums.com/index.php?topic=291568>

### Question 188

What is the strongest base among the following?

- A) IO<sup>-</sup>
- B) IO<sub>2</sub><sup>-</sup>
- C) IO<sub>3</sub><sup>-</sup>
- D) IO<sub>4</sub><sup>-</sup>

Answer: <https://biology-forums.com/index.php?topic=290745>

### Question 189

Naturally occurring organic molecules that dissolve in nonpolar solvents are called \_\_\_\_\_ of which the most plentiful in nature are \_\_\_\_\_ and \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292063>

### Question 190

The HI bond has a length of 161 pm and 4.92% ionic character. What is the experimental dipole moment of HI?

- A) 0.380 D
- B) 0.772 D
- C) 3.80 D
- D) 7.72 D

Answer: <https://biology-forums.com/index.php?topic=289685>

### Question 191

Which of these elements has the most favorable (most negative) electron affinity?

- A) Ca
- B) N
- C) Ne
- D) S

Answer: <https://biology-forums.com/index.php?topic=289505>

### Question 192

Which of the intermolecular forces is the most important contributor to the high surface tension shown by water?

- A) dipole-dipole forces
- B) dispersion forces
- C) hydrogen bonding
- D) ion-dipole forces

Answer: <https://biology-forums.com/index.php?topic=290074>

### Question 193

What is the overall reaction order for the reaction that has the rate law: Rate =  $k[\text{Cl}_2][\text{N}_2]$ ?

- A) zero order
- B) first order
- C) second order
- D) third order

Answer: <https://biology-forums.com/index.php?topic=290421>

### Question 194

What is the oxidation number of carbon in CaC<sub>2</sub>?

- A) +4
- B) 0
- C) -1
- D) -2

Answer: <https://biology-forums.com/index.php?topic=291880>

### Question 195

Convert 55 m<sup>3</sup> to liters.

- A)  $5.5 \times 10^{-2}$  L

- B) 5.5 L  
C)  $5.5 \times 10^2$  L  
D)  $5.5 \times 10^4$  L

Answer: <https://biology-forums.com/index.php?topic=288810>

### Question 196

A low-melting crystalline compound that does not conduct electricity in the solid or liquid state is classified as a \_\_\_\_\_ solid.

Answer: <https://biology-forums.com/index.php?topic=290174>

### Question 197

The number of electrons that half fill a composite s-d band is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291691>

### Question 198

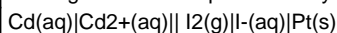
What is geometry around the oxygen atom labeled O2?

- A) bent  
B) tetrahedral  
C) trigonal planar  
D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289717>

### Question 199

In the galvanic cell represented by the shorthand notation shown below,



the inert electrode is \_\_\_\_\_, and the balanced cathode half-reaction reaction is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291269>

### Question 200

A solution has a density of 1.023 g/mL and a concentration of 0.0800 g/dL. What is the concentration in parts per million?

- A) 700 ppm  
B) 1408 ppm  
C) 550 ppm  
D) 818 ppm

Answer: <https://biology-forums.com/index.php?topic=290293>

### Question 201

According to molecular orbital theory, is the highest energy orbital that contains an electron antibonding or bonding in O<sub>2</sub>?

Answer: <https://biology-forums.com/index.php?topic=289772>

### Question 202

What is the strongest oxidizing agent of the following set: MnCl<sub>2</sub>, Mn(OH)<sub>3</sub>, MnO<sub>2</sub>, KMnO<sub>4</sub>?

- A) MnCl<sub>2</sub>  
B) Mn(OH)<sub>3</sub>  
C) MnO<sub>2</sub>  
D) KMnO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=291492>

### Question 203

Which cation in each set is expected to have the larger (more negative) hydration energy?

- I. Mg<sup>2+</sup> or Ca<sup>2+</sup>  
II. Li<sup>+</sup> or Al<sup>3+</sup>  
A) Mg<sup>2+</sup> in set I and Li<sup>+</sup> in set II  
B) Mg<sup>2+</sup> in set I and Al<sup>3+</sup> in set II  
C) Ca<sup>2+</sup> in set I and Li<sup>+</sup> in set II  
D) Ca<sup>2+</sup> in set I and Al<sup>3+</sup> in set II

Answer: <https://biology-forums.com/index.php?topic=290193>

### Question 204

The B—H—B bond in B<sub>2</sub>H<sub>6</sub> is a three-\_\_\_\_\_, two-\_\_\_\_\_ bond.

Answer: <https://biology-forums.com/index.php?topic=291908>

### Question 205

State whether the solubility of  $\text{Mg}(\text{OH})_2$  will increase or decrease upon the addition of aqueous solutions of a) HCl, b) LiOH, c)  $\text{NH}_3$ .

Answer: <https://biology-forums.com/index.php?topic=290952>

### Question 206

Which transition element has the highest melting point?

- A) Sc
- B) V
- C) Cu
- D) W

Answer: <https://biology-forums.com/index.php?topic=291556>

### Question 207

What volume of a 0.540 M NaOH solution contains 13.5 g of NaOH?

- A) 0.182 L
- B) 0.625 L
- C) 1.60 L
- D) 5.49 L

Answer: <https://biology-forums.com/index.php?topic=289280>

### Question 208

Ring strain the cause of high molecular reactivity that occurs when the angles in a ring of atoms are not close to "normal" bond angles ( $90^\circ$  when the bonds are formed by atoms using pure p-orbitals,  $109.5^\circ$  using  $\text{sp}^3$  hybrid orbitals,  $120^\circ$  using  $\text{sp}^2$  orbitals, etc.). The angles in white phosphorus,  $\text{P}_4$ , measure \_\_\_\_\_, and  $\text{P}_4$  \_\_\_\_\_ expected to exhibit ring strain and be very reactive.

Answer: <https://biology-forums.com/index.php?topic=291924>

### Question 209

Which ionic compound would be expected to have the highest lattice energy?

- A)  $\text{Cs}_2\text{O}$
- B) BaO
- C)  $\text{Ga}_2\text{O}_3$
- D)  $\text{CO}_2$

Answer: <https://biology-forums.com/index.php?topic=289556>

### Question 210

Which thermodynamic function is most related to disorder and probability?

- A) enthalpy
- B) internal energy
- C) entropy
- D) heat capacity

Answer: <https://biology-forums.com/index.php?topic=289826>

### Question 211

Determine the number of water molecules necessary to balance the reduction half reaction of \_\_\_\_\_ that occurs in an acidic solution.

- A) 1
- B) 3
- C) 5
- D) 7

Answer: <https://biology-forums.com/index.php?topic=291200>

### Question 212

How many  $\text{Br}^-$  ions are around each  $\text{Na}^+$  ion in NaBr, which has a cubic unit cell with  $\text{Br}^-$  ions on each corner and each face?

- A) 1
- B) 4
- C) 6
- D) 8

Answer: <https://biology-forums.com/index.php?topic=290162>

### Question 213

Which statement is not consistent with the chemistry of group 4A elements?

- A) Elements have the outer valence electron configuration of  $ns^2np^2$ .
- B) The most common oxidation state for the elements of the group is +4.
- C) The +4 oxidation state compounds are ionic and the +2 oxidation state compounds are covalent.
- D) The +2 oxidation state for lead is the most stable.

Answer: <https://biology-forums.com/index.php?topic=291753>

### Question 214

Which metal has maximum filling of bonding molecular orbitals and minimal filling of antibonding molecular orbitals in its composite s-d band?

- A) Au
- B) Cs
- C) Re
- D) W

Answer: <https://biology-forums.com/index.php?topic=291617>

### Question 215

How many electrons can a single orbital hold?

- A)  $2n$
- B) 2
- C)  $2l + 1$
- D) 8

Answer: <https://biology-forums.com/index.php?topic=289391>

### Question 216

Linoleic acid, a fatty acid, contains \_\_\_\_\_ carbons and \_\_\_\_\_ double bonds.

Answer: <https://biology-forums.com/index.php?topic=292062>

### Question 217

At an elevated temperature,  $K_p = 0.19$  for the reaction  $2 \text{NOCl}(g) \rightleftharpoons 2 \text{NO}(g) + \text{Cl}_2(g)$ . If the initial partial pressures of NOCl, NO, and  $\text{Cl}_2$  are 0.50 atm, 0.25 atm, and 0.45 atm, respectively, a net \_\_\_\_\_ (forward, reverse) reaction must occur in order to achieve equilibrium.

Answer: <https://biology-forums.com/index.php?topic=290615>

### Question 218

Copper has the anomalous short-hand electron configuration \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291581>

### Question 219

Which contains ionic bonds?

- A)  $\text{CH}_4$
- B)  $\text{CaCl}_2$
- C)  $\text{Cl}_2$
- D)  $\text{NCl}_3$

Answer: <https://biology-forums.com/index.php?topic=289522>

### Question 220

How many electrons are in the ion,  $\text{Fe}^{2+}$ ?

- A) 24
- B) 26
- C) 28
- D) 56

Answer: <https://biology-forums.com/index.php?topic=288994>

### Question 221

What is the temperature of  $\text{N}_2$  gas if the average speed (actually the root-mean-square speed) of the molecules is 750 m/s?

- A) 0.842 K
- B)  $6.31 \times 10^2$  K
- C)  $3.16 \times 10^2$  K

D) 0.421 K

Answer: <https://biology-forums.com/index.php?topic=289969>

### Question 222

The entropy of water at 30° is \_\_\_\_\_ than the entropy of water at 37°C.

Answer: <https://biology-forums.com/index.php?topic=291059>

### Question 223

A diode has a positive bias when the p-type semiconductor is attached to the \_\_\_\_\_ (negative, positive) battery terminal, which \_\_\_\_\_ (inhibits, permits) electron flow.

Answer: <https://biology-forums.com/index.php?topic=291696>

### Question 224

According to the Balmer-Rydberg equation, transitions from  $n = 5$  to  $m = 2$  result in a photons of light that give rise to a spectral line with what color?

Answer: <https://biology-forums.com/index.php?topic=289457>

### Question 225

The measured mass of a sample of iron was 1.88 g. Which digit in the measurement has the least certainty?

- A) the first digit, 1
- B) the middle digit, 8
- C) the last digit, 8
- D) They are all certain digits.

Answer: <https://biology-forums.com/index.php?topic=288828>

### Question 226

Which pair of ions can be separated by the addition of chloride ion?

- A)  $\text{Ag}^+$  and  $\text{Zn}^{2+}$
- B)  $\text{Ni}^{2+}$  and  $\text{Bi}^{3+}$
- C)  $\text{Pb}^{2+}$  and  $\text{Hg}_2^{2+}$
- D)  $\text{Ca}^+$  and  $\text{Li}^+$

Answer: <https://biology-forums.com/index.php?topic=290931>

### Question 227

Which of the following isotopes is the most stable?

- A)  $^6\text{He}$ , 4.89 MeV/nucleon
- B)  $^{20}\text{Ne}$ , 8.03 MeV/nucleon
- C)  $^{94}\text{Zr}$ , 8.67 MeV/nucleon
- D)  $^{240}\text{Pu}$ , 7.26 MeV/nucleon

Answer: <https://biology-forums.com/index.php?topic=291441>

### Question 228

Assume that the vapor at point c is condensed and reboiled. What is the boiling point?

- A) temperature at point b
- B) temperature at point c
- C) temperature at point d
- D) temperature at point f

Answer: <https://biology-forums.com/index.php?topic=290268>

### Question 229

In the best Lewis structure for  $\text{CN}^-$ , what is the formal charge on the N atom?

- A) -1
- B) 0
- C) +1
- D) +2

Answer: <https://biology-forums.com/index.php?topic=289647>

### Question 230

Vanadium in the +5 oxidation is most often found as compounds of

- A) bromides.

- B) chlorides.
- C) oxides.
- D) phosphides.

Answer: <https://biology-forums.com/index.php?topic=291562>

### Question 231

Which sphere most likely represents the  $\text{Ca}^{2+}$  ion?

- A) A
- B) B
- C) A or B
- D) C or D

Answer: <https://biology-forums.com/index.php?topic=289519>

### Question 232

Which is classified as an amorphous solid?

- A) palladium(II) bromide
- B) phosphorus tetrachloride
- C) plastic
- D) potassium iodide

Answer: <https://biology-forums.com/index.php?topic=290150>

### Question 233

Which acid has the lowest percent dissociation?

- A) HX
- B) HY
- C) HZ
- D) All have the same percent dissociation.

Answer: <https://biology-forums.com/index.php?topic=290727>

### Question 234

Relative to the amount of energy released in a typical chemical reaction, the amount of energy released in a typical fission reaction is about

- A) the same.
- B) 1/2 times greater.
- C) 108 times greater
- D) 107 times greater

Answer: <https://biology-forums.com/index.php?topic=291444>

### Question 235

If one mole of gas occupies 22.4 L at STP the same gas would occupy \_\_\_\_\_ than 22.4 L at  $60^\circ\text{C}$  and 630 mm Hg.

Answer: <https://biology-forums.com/index.php?topic=290055>

### Question 236

Which of the following elements has the highest density?

- A) Cr
- B) Cu
- C) Os
- D) Re

Answer: <https://biology-forums.com/index.php?topic=291557>

### Question 237

Which is a net ionic equation for the neutralization reaction of a weak acid with a weak base?

- A)  $\text{H}_3\text{O}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightleftharpoons 2 \text{H}_2\text{O}(\text{l})$
- B)  $\text{HF}(\text{aq}) + \text{NH}_3(\text{aq}) \rightleftharpoons \text{NH}_4^+(\text{aq}) + \text{F}^-(\text{aq})$
- C)  $\text{HCl}(\text{aq}) + \text{OH}^-(\text{aq}) \rightleftharpoons \text{H}_2\text{O}(\text{l}) + \text{Cl}^-(\text{aq})$
- D)  $\text{H}_3\text{O}^+(\text{aq}) + \text{NH}_3(\text{aq}) \rightleftharpoons \text{NH}_4^+(\text{aq}) + \text{H}_2\text{O}(\text{l})$

Answer: <https://biology-forums.com/index.php?topic=290886>

### Question 238

What is the chemical symbol for manganese?

- A) Hg
- B) Mg
- C) Mn
- D) Na

Answer: <https://biology-forums.com/index.php?topic=288861>

### Question 239

What is the empirical formula for perfluoropropane if the compound contains 81% fluorine and 19% carbon by mass?

- A) CF<sub>3</sub>
- B) C<sub>2</sub>F<sub>4</sub>
- C) C<sub>3</sub>F<sub>8</sub>
- D) C<sub>6</sub>F<sub>10</sub>

Answer: <https://biology-forums.com/index.php?topic=289179>

### Question 240

Which of the following has the smallest mass?

- A)  $1.40 \times 10^{24}$  molecules of I<sub>2</sub>
- B) 340. g of Cl<sub>2</sub>
- C) 10.0 mol of F<sub>2</sub>
- D) 0.200 kg of Br<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289144>

### Question 241

An aqueous solution has a normal boiling point of 105.0°C. What is the freezing point of this solution? For water  $K_b$  is 0.51°C/m and  $K_f$  = 1.86°C/m.

- A) 14.7°C
- B) -14.7°C
- C) 18.2°C
- D) -18.2°C

Answer: <https://biology-forums.com/index.php?topic=290251>

### Question 242

By analogy with the oxoanions of sulfur, H<sub>2</sub>TeO<sub>3</sub> would be named

- A) hydrotellurous acid.
- B) pertelluric acid.
- C) telluric acid.
- D) tellurous acid.

Answer: <https://biology-forums.com/index.php?topic=288922>

### Question 243

How many valence electrons does a neutral polonium atom have?

- A) 2
- B) 4
- C) 6
- D) 84

Answer: <https://biology-forums.com/index.php?topic=289444>

### Question 244

The volume of a well is 40.0 ft<sup>3</sup>. How many kilograms of concrete will it take to fill the well if the density of concrete is 2.85 g/cm<sup>3</sup>?

- A) 3.47 kg
- B)  $3.23 \times 10^3$  kg
- C)  $3.47 \times 10^3$  kg
- D)  $3.23 \times 10^6$  kg

Answer: <https://biology-forums.com/index.php?topic=288761>

### Question 245

What is not a characteristic of white phosphorus?

- A) At temperatures less than 0°C it is converted to red phosphorus.
- B) It bursts into flames when exposed to air, thus it is stored under water.
- C) It has a low melting point (44°C).
- D) It is soluble in nonpolar solvent such as carbon disulfide CS<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=291794>

### Question 246

Heat transfer measured in a coffee-cup calorimeter at constant pressure is a measure of \_\_\_\_\_, but heat transfer measured in a bomb calorimeter at constant volume is a measure of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289905>

### Question 247

Which of the following elements is most likely to occur as a metal sulfide ore?

- A) Al
- B) Hg
- C) Li
- D) Mn

Answer: <https://biology-forums.com/index.php?topic=291665>

### Question 248

Gases do not behave ideally under conditions of \_\_\_\_\_ pressure and \_\_\_\_\_ temperature.

Answer: <https://biology-forums.com/index.php?topic=290068>

### Question 249

Which one of the following is expected to exhibit resonance?

- A)  $\text{NH}_4^+$
- B) HCN
- C)  $\text{CS}_2$
- D)  $\text{NO}_3^-$

Answer: <https://biology-forums.com/index.php?topic=289646>

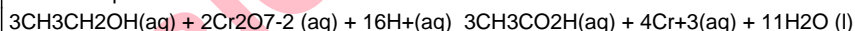
### Question 250

The combustion of methane has a standard enthalpy of combustion  $H^\circ = -802$  kJ per mole of methane burned. How many kilojoules of heat are released if 1.28 grams of oxygen are consumed in the reaction?

Answer: <https://biology-forums.com/index.php?topic=292051>

### Question 251

When suspected drunk drivers are tested with a Breathalyzer, the alcohol (ethanol) in the exhaled breath is oxidized to acetic acid with an acidic solution of potassium dichromate:



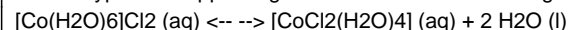
If  $E^\circ$  for this cell is 1.30V and the standard half-cell potential of  $\text{Cr}_2\text{O}_7^{2-}(\text{aq})$  to  $\text{Cr}^{3+}$  is 1.358 V, what is the standard half-cell reduction potential for the conversion of acetic acid to ethanol?

- A) 2.658 V
- B) -2.658 V
- C) + 0.058 V
- D) -0.058 V

Answer: <https://biology-forums.com/index.php?topic=291127>

### Question 252

A crude type of disappearing ink is based on the following endothermic equilibrium:



(colorless) (blue)

If the reactant solution is used to write on a piece of paper and the paper is allowed to partially dry, what can be done to bring out the colored handwriting?

- A) add water
- B) decrease the volume
- C) put the paper in a freezer
- D) put the paper in an oven

Answer: <https://biology-forums.com/index.php?topic=290553>

### Question 253

Which of the following salts are acidic?

- A) LiCl, NaCl, KCl



- B)  $\text{NH}_4\text{Cl}$ ,  $\text{CuCl}_2$ ,  $\text{AlCl}_3$   
C)  $\text{NaCH}_3\text{CO}_2$ ,  $\text{LiCH}_3\text{CO}_2$ ,  $\text{RbCH}_3\text{CO}_2$   
D)  $\text{KCl}$ ,  $\text{NH}_4\text{Cl}$ ,  $\text{Na}_2\text{CO}_3$

Answer: <https://biology-forums.com/index.php?topic=290794>

### Question 254

Elements A and Q form two compounds, AQ and A<sub>2</sub>Q. Which of the following must be true?

- A)  $(\text{mass Q})/(\text{mass A})$  is one for AQ, and 1/2 for A<sub>2</sub>Q.  
B)  $(\text{mass Q})/(\text{mass A})$  for AQ must equal  $(\text{mass Q})/(\text{mass A})$  for A<sub>2</sub>Q.  
C)  $(\text{mass Q})/(\text{mass A})$  for AQ must be 2 times  $(\text{mass Q})/(\text{mass A})$  for A<sub>2</sub>Q.  
D)  $(\text{mass Q})/(\text{mass A})$  for AQ must be 1/2  $(\text{mass Q})/(\text{mass A})$  for A<sub>2</sub>Q.

Answer: <https://biology-forums.com/index.php?topic=288887>

### Question 255

Amphetamines in urine can be confirmed by mass spectroscopy at a concentration of 500 ng/mL. Assuming a urine density of 1.025 g/mL, what is this concentration in parts per million?

Answer: <https://biology-forums.com/index.php?topic=290327>

### Question 256

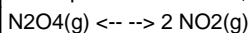
Which of the following elements is a good conductor of heat and electricity?

- A) silicon  
B) iodine  
C) radon  
D) lead

Answer: <https://biology-forums.com/index.php?topic=288962>

### Question 257

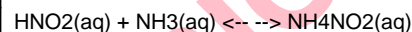
For the reaction shown below,  $\text{N}_2\text{O}_4$  and  $\text{NO}_2$  have equilibrium concentrations,  $[\text{N}_2\text{O}_4]_{\text{eq}} = 2.160 \times 10^{-4}$  and  $[\text{NO}_2]_{\text{eq}} = 1.001 \times 10^{-3}$ , respectively. The equilibrium constant,  $K_c$ , for this reaction equals \_\_\_\_\_.



Answer: <https://biology-forums.com/index.php?topic=290605>

### Question 258

What is the approximate value of the equilibrium constant,  $K_n$ , for the neutralization of nitrous acid with ammonia, shown in the equation below? The  $K_a$  for  $\text{HNO}_2$  is  $4.5 \times 10^{-4}$  and the  $K_b$  for  $\text{NH}_3$  is  $1.8 \times 10^{-5}$ .



- A)  $8.1 \times 10^5$   
B)  $1.8 \times 10^9$   
C)  $4.5 \times 10^{10}$   
D)  $8.1 \times 10^{19}$

Answer: <https://biology-forums.com/index.php?topic=290827>

### Question 259

How many significant figures are there in the answer for the following problem?

$$23.1 + 0.5848 + 11 = ?$$

- A) one  
B) two  
C) three  
D) four

Answer: <https://biology-forums.com/index.php?topic=288833>

### Question 260

What is the species present at reaction stage 3?

- A) an intermediate  
B) a product  
C) a reactant  
D) a transition state

Answer: <https://biology-forums.com/index.php?topic=290415>

### Question 261

Calculate the pH of a 0.100 M KBrO solution.  $K_a$  for hypobromous acid, HBrO, is  $2.0 \times 10^{-9}$ .

- A) 3.15
- B) 4.85
- C) 9.15
- D) 10.85

Answer: <https://biology-forums.com/index.php?topic=290717>

### Question 262

According to the law of multiple proportions, if 12 g of carbon combine with 16 g of oxygen to form CO, the number of grams of carbon that combine with 16 g of oxygen in the formation of CO<sub>2</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289048>

### Question 263

Combustion analysis of 2.796 g of an unknown compound containing carbon, hydrogen, and oxygen produced 5.597 g of CO<sub>2</sub> and 2.268 g of H<sub>2</sub>O. What is the empirical formula of the compound?

- A) C<sub>2</sub>H<sub>5</sub>O
- B) C<sub>2</sub>H<sub>5</sub>O<sub>2</sub>
- C) C<sub>2</sub>H<sub>10</sub>O<sub>3</sub>
- D) C<sub>2</sub>H<sub>4</sub>O

Answer: <https://biology-forums.com/index.php?topic=289117>

### Question 264

Formaldehyde is a carcinogenic volatile organic compound with a permissible exposure level of 0.75 ppm. At this level, how many grams of formaldehyde are permissible in a 6.0-L breath of air having a density of 1.2 kg/m<sup>3</sup>?

- A)  $3.8 \times 10^{-2}$  g formaldehyde
- B)  $5.4 \times 10^{-6}$  g formaldehyde
- C) 3.8 g formaldehyde
- D) 5.4 g formaldehyde

Answer: <https://biology-forums.com/index.php?topic=290203>

### Question 265

If a log contains 60.0% of the <sup>14</sup>C present in a living tree, how long has the log been dead? The half-life of <sup>14</sup>C is 5730 years.

- A) 2290 years
- B) 3430 years
- C) 4220 years
- D) 7560 years

Answer: <https://biology-forums.com/index.php?topic=291414>

### Question 266

Which of the following is not a geometric (cis-trans) isomer?

- A) 1, 1-dichloro-1-pentene
- B) 1, 2-dichloro-1-hexene
- C) 2-hexene
- D) 2-chloro-2-heptene

Answer: <https://biology-forums.com/index.php?topic=292016>

### Question 267

Which of the following isotopes is the least stable?

- A) <sup>7</sup>Be, 5.37 MeV/nucleon
- B) <sup>23</sup>Na, 8.11 MeV/nucleon
- C) <sup>94</sup>Zr, 8.67 MeV/nucleon
- D) <sup>240</sup>Pu, 7.26 MeV/nucleon

Answer: <https://biology-forums.com/index.php?topic=291442>

### Question 268

A reaction is performed in a water bath initially at 28°C which decreases to 10°C by the end of the reaction. For this reaction the sign of heat transfer is \_\_\_\_\_, and the reaction is classified as \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289904>

### Question 269

The diameter of the nucleus of an atom is approximately  $1 \times 10^{-13}$  cm. If 1 nm is equal to 10 what is the diameter of the nucleus in

- A)  $1 \times 10^{-23}$  Å
- B)  $1 \times 10^{-8}$  Å
- C)  $1 \times 10^{-7}$  Å
- D)  $1 \times 10^{-5}$  Å

Answer: <https://biology-forums.com/index.php?topic=288802>

### Question 270

Calculate the freezing point of a solution of 50.0 g methyl salicylate,  $C_7H_6O_2$ , dissolved in 800. g of benzene,  $C_6H_6$ .  $K_f$  for benzene is  $5.10^\circ\text{C}/\text{m}$  and the freezing point is  $5.50^\circ\text{C}$  for benzene.

- A)  $-2.61^\circ\text{C}$
- B)  $2.61^\circ\text{C}$
- C)  $2.89^\circ\text{C}$
- D)  $8.39^\circ\text{C}$

Answer: <https://biology-forums.com/index.php?topic=290248>

### Question 271

How many lone pairs are there in the Lewis structure of  $O_2$ ?

- A) 3
- B) 1
- C) 0
- D) 4

Answer: <https://biology-forums.com/index.php?topic=289643>

### Question 272

A  $1.25 \times 10^{-4}$  M solution of the anti-inflammatory drug naproxen has a  $\text{pH} = 4.2$ . The  $K_a$  and  $\text{p}K_a$  of naproxen are \_\_\_\_\_ and \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290817>

### Question 273

Compounds that have the same formula but different molecular structures are called

- A) isoelectronic.
- B) isomers.
- C) isotones.
- D) isotopes.

Answer: <https://biology-forums.com/index.php?topic=291936>

### Question 274

In which will the  $O-O$  bond be made stronger by removing an electron?

- A) only  $O_2$
- B) only  $O_2^-$
- C) only  $O_2^{2-}$
- D) all of these

Answer: <https://biology-forums.com/index.php?topic=289704>

### Question 275

The solubility of 1:1 salts is measured by the equilibrium constant for the general reaction:  $MX(s) = M^{n+}(aq) + X^{n-}(aq)$ . Given the following salts and their equilibrium constants for the reaction above at  $25^\circ\text{C}$ , which salt is the least soluble?

- A)  $MgCO_3$ ,  $K_c = 6.8 \times 10^{-6}$
- B)  $CaCO_3$ ,  $K_c = 5.0 \times 10^{-9}$
- C)  $SrCO_3$ ,  $K_c = 5.6 \times 10^{-10}$
- D)  $BaCO_3$ ,  $K_c = 2.6 \times 10^{-9}$

Answer: <https://biology-forums.com/index.php?topic=290548>

### Question 276

Which statement about the equilibrium constant is true? The value of  $K_c$

- A) changes as product concentration changes.

- B) changes as reactant concentration changes.
- C) changes as temperature changes.
- D) never changes.

Answer: <https://biology-forums.com/index.php?topic=290487>

### Question 277

What is the molecular geometry of SeF<sub>5</sub>-?

- A) octahedral
- B) seesaw
- C) square pyramidal
- D) trigonal bipyramidal

Answer: <https://biology-forums.com/index.php?topic=289724>

### Question 278

Which of the following statements about positrons is false?

- A) The positron has same mass as an electron.
- B) A positron is ejected from the nucleus during the conversion of a proton into a neutron.
- C) A positron is a positive electron.
- D) When positron emission occurs, the atomic number of the nucleus increases.

Answer: <https://biology-forums.com/index.php?topic=291336>

### Question 279

What is the ground-state electron configuration for Cr in Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup>?

- A) [Ar] 4s<sup>1</sup> 3d<sup>5</sup>
- B) [Ar] 4s<sup>2</sup> 3d<sup>6</sup>
- C) [Ar] 3d<sup>4</sup>
- D) [Ar] 3d<sup>0</sup>

Answer: <https://biology-forums.com/index.php?topic=291482>

### Question 280

Which electrostatic forces hold atoms together in a molecule?

- A) electron-electron forces
- B) electron-nucleus forces
- C) nucleus-nucleus forces
- D) all three forces

Answer: <https://biology-forums.com/index.php?topic=289582>

### Question 281

\_\_\_\_\_ properties depend only on the identity of the solute and on the number of solute particles present.

Answer: <https://biology-forums.com/index.php?topic=290338>

### Question 282

What is the sol-gel process?

- A) a series of chemical steps that involves the isolation of CuS and then roasting with oxygen
- B) a series of chemical steps that involves the isolation of SO<sub>3</sub> and then treatment with H<sub>2</sub>SO<sub>4</sub>
- C) a series of chemical steps that involves the synthesis of a metal oxide powder from a metal alkoxide
- D) a series of chemical steps that involves the thermal decomposition of fibers of polyacrylonitrile

Answer: <https://biology-forums.com/index.php?topic=291650>

### Question 283

Which of the following is not quantized?

- A) the charge on a monatomic ion
- B) the distance between two objects
- C) the population of the United States
- D) the static charge on a balloon rubbed with wool

Answer: <https://biology-forums.com/index.php?topic=289362>

### Question 284

If the quantum number  $m_s$  had possible values  $+1/2$ ,  $-1/2$ , what would be the maximum number of electrons that be placed in a single orbital?

- A) one
- B) two
- C) three
- D) four

Answer: <https://biology-forums.com/index.php?topic=289396>

### Question 285

What is the concentration of HNO<sub>3</sub> in the final solution when 70.0 mL of a 6.00 M HNO<sub>3</sub> solution is diluted with pure water to a total volume of 0.15 L?

- A)  $3.57 \times 10^{-2}$  M
- B) 2.80 M
- C) 12.6 M
- D) 1.75 M

Answer: <https://biology-forums.com/index.php?topic=289210>

### Question 286

Which one of the following gases will have the lowest rate of effusion?

- A) Ne
- B) NO<sub>2</sub>
- C) Ar
- D) SO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290043>

### Question 287

When P<sub>4</sub>O<sub>10</sub> is dissolved in water, the water will have a(n) \_\_\_\_\_ pH due to the reaction \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291922>

### Question 288

Which has the smallest dipole-dipole forces?

- A) CH<sub>3</sub>F
- B) HCl
- C) N<sub>2</sub>
- D) CO

Answer: <https://biology-forums.com/index.php?topic=289745>

### Question 289

Lead has a radius of 154 pm and crystallizes in a face-centered cubic unit cell. What is the edge length of the unit cell?

- A) 35 pm
- B) 54 pm
- C) 1232 pm
- D) 436 pm

Answer: <https://biology-forums.com/index.php?topic=290109>

### Question 290

A 0.01 M aqueous solution of which of the following is the most basic?

- A) NaClO
- B) NaClO<sub>2</sub>
- C) NaClO<sub>3</sub>
- D) NaClO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=291832>

### Question 291

Which is expected to have the most negative standard enthalpy of formation?

- A) N<sub>2</sub>(g)
- B) C<sub>5</sub>H<sub>12</sub>(g)
- C) HBr(g)
- D) H<sub>2</sub>O(g)

Answer: <https://biology-forums.com/index.php?topic=289874>

### Question 292

How many anions are there in 4.50 g of MgBr<sub>2</sub>?

- A)  $1.47 \times 10^{22}$  anions
- B)  $2.94 \times 10^{22}$  anions
- C)  $2.46 \times 10^{25}$  anions
- D)  $4.93 \times 10^{25}$  anions

Answer: <https://biology-forums.com/index.php?topic=289140>

### Question 293

The pressure in the eye of a hurricane is less than atmospheric pressure. Which one of the following pressure readings could not have been taken in the eye of a hurricane?

- A) 16 lbs/in<sup>2</sup>
- B) 66 cm Hg
- C) 660 mm Hg
- D)  $9.45 \times 10^4$  Pa

Answer: <https://biology-forums.com/index.php?topic=289992>

### Question 294

The ionic radius of Cs<sup>+</sup> is \_\_\_\_\_ than the atomic radius of Cs, and the ionic radius of I<sup>-</sup> is \_\_\_\_\_ than the atomic radius of I.

Answer: <https://biology-forums.com/index.php?topic=289573>

### Question 295

The first transuranium element was synthesized by bombarding U with neutrons. After capturing one neutron, the resulting nuclide was unstable and decayed by beta emission. What was the product of these two nuclear reactions?

- A) Np
- B) Pa
- C) Th
- D) U

Answer: <https://biology-forums.com/index.php?topic=291390>

### Question 296

Elements with \_\_\_\_\_ atomic mass are best possible candidates for a fission reaction.

- A) very low
- B) moderate
- C) moderate to heavy
- D) very heavy

Answer: <https://biology-forums.com/index.php?topic=291380>

### Question 297

Which one of the following compounds contains the smallest percent oxygen by mass?

- A) CO<sub>2</sub>
- B) N<sub>2</sub>O<sub>4</sub>
- C) P<sub>10</sub>O<sub>5</sub>
- D) C<sub>9</sub>H<sub>20</sub>O

Answer: <https://biology-forums.com/index.php?topic=289176>

### Question 298

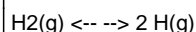
\_\_\_\_\_ is used in lights and signs.

- A) Neon
- B) Helium
- C) Iodine
- D) Silicon

Answer: <https://biology-forums.com/index.php?topic=288941>

### Question 299

According to Le Châtelier's principle, if the volume of the vessel containing the equilibrium system shown below is decreased, there will be an increase in the concentration of \_\_\_\_\_ and a decrease in the concentration of \_\_\_\_\_.



Answer: <https://biology-forums.com/index.php?topic=290621>

### Question 300

Which of the following numbers has the greatest number of significant figures?

- A) 0.8010
- B) 0.504
- C) 742000
- D)  $9.05 \times 10^{24}$

Answer: <https://biology-forums.com/index.php?topic=288822>

### Question 301

Which element has the least favorable (least negative) electron affinity?

- A) Cl
- B) S
- C) Mg
- D) As

Answer: <https://biology-forums.com/index.php?topic=289544>

### Question 302

What mass of sulfur hexafluoride, SF<sub>6</sub>, has the same number of fluorine atoms as 50.0 g of oxygen difluoride, OF<sub>2</sub>?

- A) 202.7 g
- B) 8.33 g
- C) 43.0 g
- D) 135.1 g

Answer: <https://biology-forums.com/index.php?topic=289088>

### Question 303

Lattice energy increases with \_\_\_\_\_ cation and anion charges and \_\_\_\_\_ cation and anion radii.

Answer: <https://biology-forums.com/index.php?topic=289580>

### Question 304

Tablets of ascorbic acid, or Vitamin C, C<sub>6</sub>H<sub>8</sub>O<sub>6</sub>, are taken as a dietary supplement. If a typical tablet contains 500 mg, how many molecules of Vitamin C are in a tablet?

- A) 500 molecules
- B)  $1.71 \times 10^{24}$  molecules
- C)  $3.0 \times 10^{24}$  molecules
- D)  $1.71 \times 10^{21}$  molecules

Answer: <https://biology-forums.com/index.php?topic=289098>

### Question 305

Aqueous solutions of 30% (by weight) hydrogen peroxide, H<sub>2</sub>O<sub>2</sub>, are used to oxidize metals or organic molecules in chemical reactions. Given that the density of the solution is 1.11 g/mL, calculate the molarity.

- A) 0.794 M
- B) 6.78 M
- C) 9.79 M
- D) 12.6 M

Answer: <https://biology-forums.com/index.php?topic=290224>

### Question 306

What is the strongest acid of the following?

- A) HOI
- B) HOBr
- C) HOCl
- D) All are equivalent.

Answer: <https://biology-forums.com/index.php?topic=290647>

### Question 307

What is the scandium ion concentration for a saturated solution of Sc(OH)<sub>3</sub> if the K<sub>sp</sub> for Sc(OH)<sub>3</sub> is

- A)  $3.00 \times 10^{-8}$  M
- B)  $1.31 \times 10^{-8}$  M

C)  $3.22 \times 10^{-10}$  M

D)  $3.76 \times 10^{-8}$  M

Answer: <https://biology-forums.com/index.php?topic=290923>

### Question 308

What is the deBroglie wavelength in meters of a 1-ton (907 kg) vehicle having a velocity of 95 km/hr?

Answer: <https://biology-forums.com/index.php?topic=289458>

### Question 309

An average person receives 40 mrem of radiation from medical procedures annually. If a dose as low as 25 rem can lead to a decrease in white blood cell count, what is the maximum number of medical procedures that involve radiation allowable before white blood cell count decrease occurs?

Answer: <https://biology-forums.com/index.php?topic=291478>

### Question 310

The octet rule is most likely to fail occasionally for which of the following elements?

A) C

B) Ca

C) Li

D) P

Answer: <https://biology-forums.com/index.php?topic=289552>

### Question 311

What is the pH of a 0.300 M  $\text{NH}_3$  solution that has  $K_b = 1.8 \times 10^{-5}$ ? The equation for the dissociation of  $\text{NH}_3$  is

$\text{NH}_3(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{NH}_4^+(\text{aq}) + \text{OH}^-(\text{aq})$ .

A) 2.11

B) 2.63

C) 11.89

D) 11.37

Answer: <https://biology-forums.com/index.php?topic=290782>

### Question 312

Which of the following is equivalent to 1 atm pressure?

A) 1.101325 bar

B) 1.00 bar

C) 20 psi

D) 740 mm Hg

Answer: <https://biology-forums.com/index.php?topic=289991>

### Question 313

Which element of group 5A has the most basic oxide?

A) N

B) P

C) As

D) Bi

Answer: <https://biology-forums.com/index.php?topic=291781>

### Question 314

Ethylenediaminetetraacetate ion ( $\text{EDTA}^{4-}$ ) is commonly referred to as a \_\_\_\_\_ ligand.

A) monodentate

B) tridentate

C) pentadentate

D) hexadentate

Answer: <https://biology-forums.com/index.php?topic=291569>

### Question 315

What is the molecular geometry of  $\text{ICl}_4^-$ ?

A) seesaw

B) square planar

C) square pyramidal



D) tetrahedral

Answer: <https://biology-forums.com/index.php?topic=289721>

### Question 316

NO<sub>2</sub>- is be expected to have

- A) two single bonds.
- B) one single and one double bond.
- C) two double bonds.
- D) two identical bonds intermediate between a single and a double bond.

Answer: <https://biology-forums.com/index.php?topic=289615>

### Question 317

Of the following, which element has the highest first ionization energy?

- A) argon
- B) neon
- C) helium
- D) krypton

Answer: <https://biology-forums.com/index.php?topic=289484>

### Question 318

Another term for alkanes is

- A) alkenes.
- B) alkynes.
- C) saturated hydrocarbons.
- D) unsaturated hydrocarbons.

Answer: <https://biology-forums.com/index.php?topic=291935>

### Question 319

A greenhouse gas of greatest concern that is from human activities is

- A) oxygen.
- B) fluorine.
- C) radon.
- D) methane.

Answer: <https://biology-forums.com/index.php?topic=290045>

### Question 320

Identify the smallest item.

- A) the width of human hair
- B) a white blood cell
- C) a virus
- D) a sugar

Answer: <https://biology-forums.com/index.php?topic=288843>

### Question 321

What kind of packing do the anions adopt?

- A) body-centered cubic
- B) cubic closest packed (face-centered cubic)
- C) hexagonal closest packed
- D) simple cubic

Answer: <https://biology-forums.com/index.php?topic=290125>

### Question 322

Which statement about buffers is true?

- A) Buffers have a pH = 7.
- B) Buffers consist of a strong acid and its conjugate base.
- C) A buffer does not change pH on addition of a strong acid or strong base.
- D) Buffers resist change in pH upon addition of small amounts of strong acid or strong base.

Answer: <https://biology-forums.com/index.php?topic=290832>

### Question 323

The amide bonds that form when two or more amino acids link together are called \_\_\_\_\_ bonds.

Answer: <https://biology-forums.com/index.php?topic=292064>

### Question 324

To make a 3.00 m solution, one could take 3.00 moles of solute and add

- A) 1.00 L of solvent.
- B) 1.00 kg of solvent.
- C) enough solvent to make 1.00 L of solution.
- D) enough solvent to make 1.00 kg of solution.

Answer: <https://biology-forums.com/index.php?topic=290219>

### Question 325

The existence of electrons in atoms of all elements was demonstrated by

- A) Millikan's oil drop experiment.
- B) Rutherford's gold foil experiment.
- C) Thomson's cathode ray tube experiment.
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=288889>

### Question 326

For a reaction that follows the general rate law,  $\text{Rate} = k[A][B]^2$ , what will happen to the rate of reaction if the concentration of B is increased by a factor of 2.00? The rate will

- A) decrease by a factor of 1/4.00.
- B) decrease by a factor of 1/2.00.
- C) increase by a factor of 2.00.
- D) increase by a factor of 4.00.

Answer: <https://biology-forums.com/index.php?topic=290361>

### Question 327

Which element has the chemical symbol, P?

- A) lead
- B) phosphorus
- C) platinum
- D) potassium

Answer: <https://biology-forums.com/index.php?topic=288862>

### Question 328

None of the listed compounds contains a ring. Which could have one carbon-carbon triple bond?

- A) C<sub>3</sub>H<sub>8</sub>
- B) C<sub>2</sub>H<sub>2</sub>
- C) C<sub>10</sub>H<sub>20</sub>
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=292006>

### Question 329

Commercially oxygen is usually obtained by

- A) decomposition of mercury(II) oxide.
- B) decomposition of potassium chlorate.
- C) electrolytic decomposition of water.
- D) fractional distillation of air.

Answer: <https://biology-forums.com/index.php?topic=291805>

### Question 330

A solution with hydronium ion concentration  $[H^+] = 1.60 \times 10^{-2} \text{ M}$  has a hydroxide ion concentration  $[OH^-] =$  \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290805>

### Question 331

Photochemists use electromagnetic radiation to initiate chemical reactions, often by providing the energy required to break bonds within a molecule. Lowering which of the following will result in electromagnetic radiation having more energy per photon?

- A) amplitude
- B) frequency
- C) intensity
- D) wavelength

Answer: <https://biology-forums.com/index.php?topic=289361>

### Question 332

What is the coordination number of the Au atom in  $K[Au(CN)_2(SCN)_2]$ ?

- A) 2
- B) 3
- C) 4
- D) 6

Answer: <https://biology-forums.com/index.php?topic=291507>

### Question 333

How many orbitals are there in the seventh shell?

- A) 6
- B) 7
- C) 21
- D) 49

Answer: <https://biology-forums.com/index.php?topic=289390>

### Question 334

Which one of the following compounds behaves as an acid when dissolved in water?

- A) SrO
- B)  $C_3H_8$
- C) HCl
- D) LiOH

Answer: <https://biology-forums.com/index.php?topic=289306>

### Question 335

The enthalpy for the following reaction is 136 kJ. If the reaction takes place in a closed container, which one of the following reaction conditions will not decrease the concentration of water vapor?



- A) remove  $CO_2$
- B) cool the container
- C) decrease the volume of the container
- D) add some  $NaHCO_3$

Answer: <https://biology-forums.com/index.php?topic=290591>

### Question 336

In the protein, Asn-Phe-Cys-Lys, which amino acid contains the C-terminal group?

- A) asparagine
- B) cysteine
- C) lysine
- D) phenylalanine

Answer: <https://biology-forums.com/index.php?topic=291979>

### Question 337

What does the term "hydrophobic" mean?

- A) water reactive
- B) water repelling
- C) water soluble
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=291976>

### Question 338

Which has the highest standard molar entropy at  $25^\circ C$ ?

- A) F<sub>2</sub>(g)
- B) N<sub>2</sub>(g)
- C) Cl<sub>2</sub>(g)
- D) I<sub>2</sub>(g)

Answer: <https://biology-forums.com/index.php?topic=291037>

### Question 339

What is the most important copper containing ore?

- A) bauxite
- B) chalcopyrite
- C) pyrolusite
- D) ilmenite

Answer: <https://biology-forums.com/index.php?topic=291658>

### Question 340

What metal is isolated from the ore sphalerite?

- A) chromium
- B) iron
- C) silver
- D) zinc

Answer: <https://biology-forums.com/index.php?topic=291660>

### Question 341

Which has the lowest entropy?

- A) CH<sub>3</sub>OH(s, -26°C)
- B) CH<sub>3</sub>OH(s, -13°C)
- C) CH<sub>3</sub>OH(l, 16°C)
- D) CH<sub>3</sub>OH(l, 30°C)

Answer: <https://biology-forums.com/index.php?topic=291031>

### Question 342

Which of the following compounds is an Arrhenius base in water?

- A) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
- B) CH<sub>3</sub>COOH
- C) KCl
- D) NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289228>

### Question 343

Consider a buffered solution consisting of H<sub>2</sub>CO<sub>3</sub> and HCO<sub>3</sub><sup>-</sup> where the pK<sub>a</sub> = 6.4. At pH = 6.4, which of the following is true?

- A) [H<sub>2</sub>CO<sub>3</sub>] > [HCO<sub>3</sub><sup>-</sup>]
- B) [H<sub>2</sub>CO<sub>3</sub>] < [HCO<sub>3</sub><sup>-</sup>]
- C) [H<sub>2</sub>CO<sub>3</sub>] = [HCO<sub>3</sub><sup>-</sup>]
- D) [H<sub>2</sub>CO<sub>3</sub>] < [CO<sub>3</sub><sup>2-</sup>]

Answer: <https://biology-forums.com/index.php?topic=290851>

### Question 344

Sulfurous acid, H<sub>2</sub>SO<sub>3</sub> has acid dissociation constants K<sub>a1</sub> = 1.5 × 10<sup>-2</sup> and K<sub>a2</sub> = 6.3 × 10<sup>-8</sup>. What is the pH after 10.00 mL of 0.1000 M NaOH is added to 10.00 mL of 0.1000 M H<sub>2</sub>SO<sub>3</sub>?

- A) 1.82
- B) 3.60
- C) 4.25
- D) 7.20

Answer: <https://biology-forums.com/index.php?topic=290864>

### Question 345

Which of the following elements would you expect to have the largest number of stable isotopes? Element number:

- A) 48
- B) 49
- C) 50

D) 51

Answer: <https://biology-forums.com/index.php?topic=291348>

### Question 346

What is the molar mass of iodine?

- A) 126.9 g/mol
- B) 253.8 g/mol
- C)  $6.02 \times 10^{23}$  g/mol
- D)  $1.20 \times 10^{24}$  g/mol

Answer: <https://biology-forums.com/index.php?topic=289079>

### Question 347

Which of the following is not an advantage of fusion reactions over fission reactions for power generation?

- A) cheap and plentiful fuel
- B) ease of reaction initiation
- C) Fusion products are non-polluting.
- D) Fusion products are nonradioactive.

Answer: <https://biology-forums.com/index.php?topic=291376>

### Question 348

To reach a noble gas electron configuration how many electrons would tellurium have to adopt?

- A) 1
- B) 2
- C) 7
- D) 4

Answer: <https://biology-forums.com/index.php?topic=289548>

### Question 349

A gas molecule at 298 K and 1 atm pressure undergoes a collision with another gas molecule approximately every \_\_\_\_\_ seconds.

- A) 10-15
- B) 10-9
- C) 10-6
- D) 10-3

Answer: <https://biology-forums.com/index.php?topic=290390>

### Question 350

A molecule with the formula  $XF_3$  where the element X has the hybridization  $sp^3$ . Which of the following elements could be Y?

- A) C
- B) P
- C) B
- D) Si

Answer: <https://biology-forums.com/index.php?topic=289680>

### Question 351

All of the following are fundamental SI units except the

- A) year.
- B) kilogram.
- C) mole.
- D) Kelvin.

Answer: <https://biology-forums.com/index.php?topic=288788>

### Question 352

Pyrite is called fool's gold because it looks like real gold. However, pyrite has a density of 4.5 g/mL while gold has a density of 19.3 g/mL. Use this information to determine which of the following statements is true.

- A) 25 grams of gold will occupy a greater volume than 25 grams of pyrite.
- B) 25 grams of gold will occupy the same volume as 25 grams of pyrite.
- C) 25 mL of gold will have a greater mass than 25 mL of pyrite.
- D) 25 mL of gold will have less mass than 25 mL of pyrite.

Answer: <https://biology-forums.com/index.php?topic=288755>

### Question 353

Calculate the freezing point of a solution of 30.0 g methyl salicylate, C<sub>7</sub>H<sub>6</sub>O<sub>2</sub>, dissolved in 800. g of benzene, C<sub>6</sub>H<sub>6</sub>. K<sub>f</sub> for benzene is 5.10°C/m and the freezing point is 5.50°C for benzene.

- A) -1.56°C
- B) 1.56°C
- C) 3.93°C
- D) 7.06°C

Answer: <https://biology-forums.com/index.php?topic=290313>

### Question 354

At 25°C the heat of fusion of aluminum is 10.6 kJ/mol and the heat of sublimation is 326.4 kJ/mol. What is the heat of vaporization of aluminum at 25°C?

- A) 158.2 kJ/mol
- B) 168.5 kJ/mol
- C) 315.8 kJ/mol
- D) 337.0 kJ/mol

Answer: <https://biology-forums.com/index.php?topic=289799>

### Question 355

List the elements Na, Ca, Rb, Cl, He in order of decreasing first ionization energy.

- A) He > Cl > Ca > Na > Rb
- B) He > Na > Ca > Cl > Rb
- C) He > Na > Cl > Ca > Rb
- D) Rb > Ca > Cl > Na > He

Answer: <https://biology-forums.com/index.php?topic=289490>

### Question 356

Which ionic compound would be expected to have the highest lattice energy?

- A) AlH<sub>3</sub>
- B) Al<sub>2</sub>S<sub>3</sub>
- C) AlCl<sub>3</sub>
- D) AlN

Answer: <https://biology-forums.com/index.php?topic=289560>

### Question 357

A basketball is inflated to a pressure of 2.10 atm in a 20.0°C garage. What is the pressure of the basketball outside where the temperature is -5.00°C?

- A) 1.92 atm
- B) 2.29 atm
- C) 2.10 atm
- D) 2.50 atm

Answer: <https://biology-forums.com/index.php?topic=289927>

### Question 358

At 1 atm pressure, the heat of sublimation of gallium is 277 kJ/mol and the heat of vaporization is 271 kJ/mol. To the correct number of significant figures, how much heat is required to melt 1.50 mol of gallium at 1 atm pressure?

- A) 6 kJ
- B) 9 kJ
- C) 268 kJ
- D) 271 kJ

Answer: <https://biology-forums.com/index.php?topic=289857>

### Question 359

The reaction  $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{O}_2(\text{g})$  is endothermic 298 K. The effect of adding CaO to the system at equilibrium will \_\_\_\_\_ (decrease, increase, have no effect on) the total quantity of CaO once equilibrium is reestablished.

Answer: <https://biology-forums.com/index.php?topic=290620>

### Question 360

Which does not apply to a nuclear fusion reaction?

- A) Atoms of one element cannot be converted to atoms of another element.
- B) Energy is conserved.
- C) Matter is conserved.
- D) None of these apply to a nuclear fusion reaction.

Answer: <https://biology-forums.com/index.php?topic=291375>

### Question 361

How many subshells are there in the shell with  $n = 4$ ?

- A) 3
- B) 4
- C) 6
- D) 18

Answer: <https://biology-forums.com/index.php?topic=289419>

### Question 362

Which of the following statements about helium is inconsistent with its chemistry?

- A) A helium oxygen mixture is used as a deep-sea diving gas instead of compressed air.
- B) In its liquid form it is used as a cryogenic coolant for superconductors.
- C) It is one of the more reactive elements of its group.
- D) Its melting point is  $-272.2^{\circ}\text{C}$  and its boiling point is  $-268.9^{\circ}\text{C}$ .

Answer: <https://biology-forums.com/index.php?topic=291838>

### Question 363

Which one of the following elements can form more than four chemical bonds with other elements?

- A) N
- B) O
- C) F
- D) S

Answer: <https://biology-forums.com/index.php?topic=291856>

### Question 364

Which of the following should have the lowest bond strength?

- A) HOI
- B) HOCl
- C) HOAt
- D) HOBr

Answer: <https://biology-forums.com/index.php?topic=290648>

### Question 365

What is the pH of the solution formed when 50 mL of 0.250 M NaOH is added to 50 mL of 0.120 M HCl?

Answer: <https://biology-forums.com/index.php?topic=290946>

### Question 366

Which of the following statements is not consistent with the properties of a molecular solid?

- A) a compound that conducts electricity when molten
- B) a low melting solid
- C) a solid formed by the combination of two nonmetallic elements
- D) a solid that is a nonconductor of electricity

Answer: <https://biology-forums.com/index.php?topic=290095>

### Question 367

A solution is prepared by dissolving 17.75 g sulfuric acid,  $\text{H}_2\text{SO}_4$ , in enough water to make exactly 100.0 mL of solution. If the density of the solution is 1.1094 g/mL, what is the weight %  $\text{H}_2\text{SO}_4$  in the solution?

- A) 16.00%
- B) 18.00%
- C) 19.00%
- D) 84.00%

Answer: <https://biology-forums.com/index.php?topic=290210>

### Question 368

What is the pH of a solution made by mixing 30.00 mL of 0.10 M HCl with 40.00 mL of 0.10 M KOH? Assume that the volumes of the solutions are additive.

- A) 0.85
- B) 1.85
- C) 12.15
- D) 13.15

Answer: <https://biology-forums.com/index.php?topic=290853>

### Question 369

How many oxygen atoms are there in 6.00 g of sodium dichromate, Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>?

- A) 0.160 oxygen atoms
- B)  $1.97 \times 10^{21}$  oxygen atoms
- C)  $1.37 \times 10^{22}$  oxygen atoms
- D)  $9.65 \times 10^{22}$  oxygen atoms

Answer: <https://biology-forums.com/index.php?topic=289135>

### Question 370

The most important characteristic of carbon atoms for forming organic molecules is

- A) ability to bond together to form long chains.
- B) ability to form multiple covalent bonds.
- C) use of hybrid orbitals.
- D) A and B

Answer: <https://biology-forums.com/index.php?topic=291933>

### Question 371

Which of the following changes in reaction conditions will alter the composition of an equilibrium mixture of gases for a reaction having unequal moles of gaseous products and gaseous reactants?

- A) adding of products
- B) decreasing the volume
- C) increasing the temperature
- D) All of these will alter the equilibrium concentrations.

Answer: <https://biology-forums.com/index.php?topic=290589>

### Question 372

What statement is not characteristic about group 6A elements?

- A) Oxygen, sulfur, and selenium are typical nonmetals while tellurium is a semi-metal.
- B) Oxygen is a powerful oxidizing agent but H<sub>2</sub>Se and H<sub>2</sub>Te are good reducing agents.
- C) S, Se, and Te are much less electronegative than oxygen and commonly have positive oxidation states.
- D) The favored oxidation state of Te and Po is +2.

Answer: <https://biology-forums.com/index.php?topic=291799>

### Question 373

What is the freezing point of a solution of 2.86 g MgCl<sub>2</sub> in 100 g of water? K<sub>f</sub> for water is 1.86°C/m.

- A) -0.0558°C
- B) -0.558°C
- C) -1.12°C
- D) -1.67°C

Answer: <https://biology-forums.com/index.php?topic=290314>

### Question 374

At 298 K, K<sub>p</sub> =  $2.1 \times 10^4$  for the reaction CO(g) + 2 H<sub>2</sub>(g)  $\rightleftharpoons$  CH<sub>3</sub>OH(g). What is the value of K<sub>c</sub> at this temperature?

Answer: <https://biology-forums.com/index.php?topic=290608>

### Question 375

Which is not a solution?

- A) sterling silver
- B) fog



- C) hydrochloric acid
- D) coffee

Answer: <https://biology-forums.com/index.php?topic=290269>

### Question 376

Hydrogen, H<sub>2</sub>, has a very low boiling point. What is the force that must be overcome in order to boil hydrogen?

- A) dipole-dipole
- B) H—H covalent bonding
- C) hydrogen bonding
- D) London dispersion

Answer: <https://biology-forums.com/index.php?topic=291721>

### Question 377

What is the hybridization on the N atom in NO<sub>2</sub><sup>-</sup> and in NO<sub>3</sub><sup>-</sup>?

- A) sp<sup>2</sup> for NO<sub>2</sub><sup>-</sup> and sp<sup>3</sup> for NO<sub>3</sub><sup>-</sup>
- B) sp<sup>3</sup> for NO<sub>2</sub><sup>-</sup> and sp<sup>2</sup> for NO<sub>3</sub><sup>-</sup>
- C) sp for NO<sub>2</sub><sup>-</sup> and sp<sup>2</sup> for NO<sub>3</sub><sup>-</sup>
- D) sp<sup>2</sup> for both

Answer: <https://biology-forums.com/index.php?topic=289679>

### Question 378

If K<sub>c</sub> = 0.600, and K<sub>p</sub> = 359 for a hypothetical reaction, which of the equations below could represent the reaction at 25°C?

- A) 4 A(g) + B(s)  $\rightleftharpoons$  6 C(g)
- B) A(l) + 2 B(g)  $\rightleftharpoons$  2 C(g)
- C) B(g)  $\rightleftharpoons$  C(l) + D(l)
- D) A(g)  $\rightleftharpoons$  2 C(s) + D(g)

Answer: <https://biology-forums.com/index.php?topic=290573>

### Question 379

The isotope represented by <sup>C</sup> is named

- A) carbon-6.
- B) carbon-3.
- C) carbon-9.
- D) carbon-15.

Answer: <https://biology-forums.com/index.php?topic=288979>

### Question 380

What is the top chemical compound produced in the United States?

- A) Cl<sub>2</sub>
- B) NI<sub>3</sub>
- C) NaBr
- D) H<sub>2</sub>SO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=291846>

### Question 381

Which compound will exhibit cis-trans isomerism?

- A) 1, 2-dichloroethane
- B) 1, 2-dichloroethene
- C) dichloroethyne
- D) ethylene

Answer: <https://biology-forums.com/index.php?topic=291960>

### Question 382

A solution of LiCl in water is 22.0 wt% LiCl. What is the mole fraction of LiCl?

- A) 0.107
- B) 0.120
- C) 0.519
- D) 4.33

Answer: <https://biology-forums.com/index.php?topic=290292>

### Question 383

For a multielectron atom, a 3s orbital lies lower in energy than a 3p orbital because

- A) a 3p orbital has more nodal surfaces than a 3s orbital.
- B) other electrons more effectively shield electrons in the 3s orbital from the nucleus.
- C) other electrons more effectively shield electrons in the 3p orbital from the nucleus.
- D) there are more p orbitals than s orbitals in a given shell.

Answer: <https://biology-forums.com/index.php?topic=289399>

### Question 384

What is the ground-state electron configuration of the ion  $\text{Cu}^{2+}$ ?

- A)  $[\text{Ar}] 3d^9$
- B)  $[\text{Ar}] 4s^1 3d^8$
- C)  $[\text{Ar}] 4s^2 3d^7$
- D)  $[\text{Ar}] 4s^2 3d^{10} 4p^1$

Answer: <https://biology-forums.com/index.php?topic=289473>

### Question 385

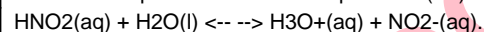
What is the hydronium ion concentration in a solution prepared by mixing 50.00 mL of 0.10 M HCN with 50.00 mL of NaCN? Assume that the volumes of the solutions are additive and that  $K_a = 4.9 \times 10^{-10}$  for HCN.

- A)  $4.9 \times 10^{-11}$  M
- B)  $4.9 \times 10^{-10}$  M
- C)  $4.9 \times 10^{-9}$  M
- D)  $7.0 \times 10^{-6}$  M

Answer: <https://biology-forums.com/index.php?topic=290893>

### Question 386

What is the equilibrium constant expression ( $K_a$ ) for the acid dissociation of nitrous acid  $\text{HNO}_2$ ? The equation of interest is



- A)  $K_a = \frac{[\text{H}_3\text{O}^+][\text{NO}_2^-]}{[\text{HNO}_2][\text{H}_2\text{O}]}$
- B)  $K_a = \frac{[\text{H}_3\text{O}^+][\text{NO}_2^-]}{[\text{HNO}_2]}$
- C)  $K_a = \frac{[\text{HNO}_2][\text{H}_2\text{O}]}{[\text{H}_3\text{O}^+][\text{NO}_2^-]}$
- D)  $K_a = \frac{[\text{HNO}_2]}{[\text{H}_3\text{O}^+][\text{NO}_2^-]}$

Answer: <https://biology-forums.com/index.php?topic=290680>

### Question 387

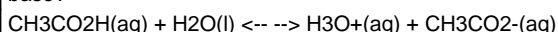
The monosaccharide shown below is a(n)

- A) aldohexose.
- B) aldopentose.
- C) ketohexose.
- D) ketopentose.

Answer: <https://biology-forums.com/index.php?topic=291950>

### Question 388

The equilibrium constant,  $K$ , for the reaction shown below has a value  $1.8 \times 10^{-5}$ . In this reaction which is the strongest acid and which is the strongest base?



- A)  $\text{CH}_3\text{CO}_2\text{H}$  and  $\text{CH}_3\text{CO}_2^-$
- B)  $\text{CH}_3\text{CO}_2\text{H}$  and  $\text{H}_2\text{O}$
- C)  $\text{H}_3\text{O}^+$  and  $\text{H}_2\text{O}$
- D)  $\text{H}_3\text{O}^+$  and  $\text{CH}_3\text{CO}_2^-$

Answer: <https://biology-forums.com/index.php?topic=290641>

### Question 389

What are the three most abundant elements in the human body?

- A) H, C, O
- B) H, O, Fe
- C) H, C, N
- D) H, C, P

Answer: <https://biology-forums.com/index.php?topic=291845>

### Question 390

In a reversible reaction, when the rate of the forward reaction equals the rate of the reverse reaction, the reaction is at \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290603>

### Question 391

Which molecule contains a triple bond?

- A) O<sub>2</sub>
- B) O<sub>3</sub>
- C) HCCH
- D) Br<sub>2</sub>SO

Answer: <https://biology-forums.com/index.php?topic=289635>

### Question 392

Which of the following elements has chemical properties similar to oxygen?

- A) fluorine
- B) hydrogen
- C) nitrogen
- D) sulfur

Answer: <https://biology-forums.com/index.php?topic=288949>

### Question 393

Which of the following amino acids is acidic?

- A) alanine
- B) aspartic acid
- C) glutamine
- D) histidine

Answer: <https://biology-forums.com/index.php?topic=292033>

### Question 394

In C<sub>3</sub>H<sub>7</sub>NHC<sub>3</sub>H<sub>7</sub>, which intermolecular forces are present?

- A) Dispersion, hydrogen bonding and dipole-dipole forces are present.
- B) Only dipole-dipole and ion-dipole forces are present.
- C) Only dispersion and dipole-dipole forces are present.
- D) Only hydrogen bonding forces are present.

Answer: <https://biology-forums.com/index.php?topic=289752>

### Question 395

What is the mole fraction of ethanol in a solution made by dissolving 7.30 g of ethanol, C<sub>2</sub>H<sub>5</sub>OH, in 53.6 g of water?

- A) 0.0505
- B) 0.0531
- C) 0.120
- D) 0.136

Answer: <https://biology-forums.com/index.php?topic=290277>

### Question 396

How many sulfate ions are there in 5.00 g of FeSO<sub>4</sub>?

- A)  $5.46 \times 10^{-26}$  iron (II) ions
- B)  $1.98 \times 10^{22}$  iron (II) ions
- C)  $1.83 \times 10^{25}$  iron (II) ions
- D)  $4.58 \times 10^{26}$  iron (II) ions

Answer: <https://biology-forums.com/index.php?topic=289083>

### Question 397

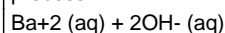
Which of the following is the principal cause of global warming?

- A) acid rain
- B) air pollution
- C) greenhouse effect
- D) ozone depletion

Answer: <https://biology-forums.com/index.php?topic=289984>

### Question 398

Barium hydroxide is slightly soluble in water, with a  $K_{sp}$  of  $5.00 \times 10^{-4}$  at 298K. The dissolution of barium hydroxide in water is an endothermic process.



Which of the following will increase the solubility?

- A) Barium hydroxide is added to the solution.
- B) Sodium hydroxide (NaOH) is added to the solution.
- C) The temperature is decreased.
- D) HCl is added to the mixture. (HCl reacts with  $\text{OH}^{-}$ , removing it from the system.)

Answer: <https://biology-forums.com/index.php?topic=290878>

### Question 399

What is the coordination number of Si in SiC that has a diamond-like structure?

- A) 1
- B) 2
- C) 4
- D) 6

Answer: <https://biology-forums.com/index.php?topic=291682>

### Question 400

Which of the following compounds is an Arrhenius base in water?

- A)  $\text{CH}_3\text{CH}_3$
- B)  $\text{CH}_3\text{SH}$
- C)  $\text{HOCl}$
- D)  $\text{KOH}$

Answer: <https://biology-forums.com/index.php?topic=289229>

### Question 401

Which contains the greatest number of bromide ions?

- A) 50 mL of 2.0 M KBr
- B) 100 mL of 1.0 M  $\text{BaBr}_2$
- C) 20 mL of 2.5 M  $\text{FeBr}_3$
- D) All contain the same number of chloride ions.

Answer: <https://biology-forums.com/index.php?topic=289287>

### Question 402

How many electrons are in the ion,  $\text{S}^{2-}$ ?

- A) 14
- B) 18
- C) 30
- D) 34

Answer: <https://biology-forums.com/index.php?topic=288995>

### Question 403

What is the weakest acid among the following?

- A)  $\text{SiH}_4$
- B)  $\text{PH}_3$
- C)  $\text{H}_2\text{S}$
- D)  $\text{HCl}$

Answer: <https://biology-forums.com/index.php?topic=290646>

### Question 404

The reaction  $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{O}_2(\text{g})$  is endothermic at 298 K. The effect of increasing the temperature of the system at equilibrium will \_\_\_\_\_ (decrease, increase, have no effect on) the total quantity of  $\text{CaCO}_3$  once equilibrium is reestablished.

Answer: <https://biology-forums.com/index.php?topic=290625>

### Question 405

What are the possible values of  $l$  if  $n = 5$ ?

- A) 5
- B) 0, 1, 2, 3, or 4
- C) -4, -3, -2, -1, 0, +1, +2, +3, or +4
- D) -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, or +5

Answer: <https://biology-forums.com/index.php?topic=289384>

### Question 406

Which of the following mixtures would result in a buffered solution when 1.0 L of each of the two solutions are mixed.

- A) 0.2 M  $\text{HNO}_3$  and 0.2 M  $\text{NaNO}_3$
- B) 0.2 M  $\text{HNO}_3$  and 0.4 M  $\text{HF}$
- C) 0.2 M  $\text{HNO}_3$  and 0.4 M  $\text{NaF}$
- D) 0.2 M  $\text{HNO}_3$  and 0.4 M  $\text{NaOH}$

Answer: <https://biology-forums.com/index.php?topic=290843>

### Question 407

In the combustion analysis of an unknown compound containing only carbon, hydrogen, and oxygen, the grams of oxygen are found from the grams of

- A)  $\text{CO}_2$  only.
- B)  $\text{H}_2\text{O}$  only.
- C)  $\text{CO}_2$  and  $\text{H}_2\text{O}$  only.
- D)  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and unknown compound.

Answer: <https://biology-forums.com/index.php?topic=289115>

### Question 408

Which of the following is not a valence bond concept?

- A) The greater the overlap between the orbitals on two atoms, the stronger the bond.
- B) Lone pair electrons are in atomic orbitals or in hybrid atomic orbitals.
- C) Atomic orbitals on two atoms may overlap to form antibonding orbitals.
- D) A pair of electrons in a bond is shared by both atoms.

Answer: <https://biology-forums.com/index.php?topic=289669>

### Question 409

The amount of data that can be stored in an optical disc storage medium is related to the wavelength of the laser employed. Blu-Ray discs that are read by a laser having a wavelength of 405 nm have a much greater storage capacity than a DVD that is read by a 650 nm laser. The color of the 405 nm laser beam is \_\_\_\_\_, whereas the color of the 650 nm laser is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289454>

### Question 410

One reason ionic compounds do not dissolve well in nonpolar solvents is that

- A) ion-dipole interactions are too large for effective solvation to occur.
- B) ion-solvent interactions are not strong enough to solvate the ions in solution.
- C) not all cations and anions have the same magnitude of charge and therefore do not form neutral ion pairs.
- D) there are no forces of attraction between ions and nonpolar molecules.

Answer: <https://biology-forums.com/index.php?topic=290192>

### Question 411

What is the geometric structure of  $\text{BF}_3$  and the hybridization of the B atom?

- A) trigonal planar and  $sp^2$  hybridization
- B) trigonal planar and  $sp^3$  hybridization
- C) pyramidal and  $sp$  hybridization
- D) tetrahedral and  $sp^2$  hybridization

Answer: <https://biology-forums.com/index.php?topic=291874>

### Question 412

What is the pH of a solution prepared by mixing 25.00 mL of 0.10 M  $\text{CH}_3\text{CO}_2\text{H}$  with 25.00 mL of 0.040 M  $\text{CH}_3\text{CO}_2\text{Na}$ ? Assume that the volume of the solutions are additive and that  $K_a = 1.8 \times 10^{-5}$  for  $\text{CH}_3\text{CO}_2\text{H}$ .

- A) 2.87
- B) 4.35
- C) 4.75

D) 5.14

Answer: <https://biology-forums.com/index.php?topic=290894>

### Question 413

The cubic closest-packed arrangement of atoms is the same as which cubic unit cell?

Answer: <https://biology-forums.com/index.php?topic=290177>

### Question 414

Stored energy is \_\_\_\_\_ energy, and energy of motion is \_\_\_\_\_ energy.

Answer: <https://biology-forums.com/index.php?topic=288855>

### Question 415

Using principles discussed in chapters 15 and 19, determine which of the following is the strongest acid.

- A) HClO
- B) HClO<sub>2</sub>
- C) HClO<sub>3</sub>
- D) HClO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=291833>

### Question 416

Acetic acid CH<sub>3</sub>COOH, has an acid dissociation constant of  $1.8 \times 10^{-5}$ . What is the conjugate base of acetic acid and what is its base dissociation constant?

- A) CH<sub>3</sub>C(OH)<sub>2</sub><sup>+</sup>,  $5.6 \times 10^4$
- B) CH<sub>3</sub>C(OH)<sub>2</sub><sup>+</sup>,  $5.6 \times 10^{-10}$
- C) CH<sub>3</sub>COOH,  $5.6 \times 10^{-10}$
- D) CH<sub>3</sub>CO<sub>2</sub><sup>-</sup>,  $5.6 \times 10^{-10}$

Answer: <https://biology-forums.com/index.php?topic=290710>

### Question 417

\_\_\_\_\_ energy is the kinetic energy of molecular motion.

Answer: <https://biology-forums.com/index.php?topic=289890>

### Question 418

Which statement about elemental analysis by combustion is not correct?

- A) Carbon is determined from the amount of CO<sub>2</sub> formed.
- B) Hydrogen is determined from the amount of H<sub>2</sub>O formed.
- C) Oxygen is determined from the amount of H<sub>2</sub>O formed.
- D) Only carbon and hydrogen can be determined directly from CO<sub>2</sub> and H<sub>2</sub>O.

Answer: <https://biology-forums.com/index.php?topic=289114>

### Question 419

Which group 6A element has the most negative electron affinity?

- A) Te
- B) S
- C) N
- D) C

Answer: <https://biology-forums.com/index.php?topic=291891>

### Question 420

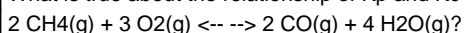
Arrange the ions N<sup>3-</sup>, O<sup>2-</sup>, Mg<sup>2+</sup>, Na<sup>+</sup>, and F<sup>-</sup> in order of increasing ionic radius, starting with the smallest first.

- A) Mg<sup>2+</sup>, Na<sup>+</sup>, F<sup>-</sup>, O<sup>2-</sup>, N<sup>3-</sup>
- B) N<sup>3-</sup>, Mg<sup>2+</sup>, O<sup>2-</sup>, Na<sup>+</sup>, F<sup>-</sup>
- C) N<sup>3-</sup>, O<sup>2-</sup>, Mg<sup>2+</sup>, F<sup>-</sup>, Na<sup>+</sup>
- D) N<sup>3-</sup>, O<sup>2-</sup>, F<sup>-</sup>, Na<sup>+</sup>, Mg<sup>2+</sup>

Answer: <https://biology-forums.com/index.php?topic=289480>

### Question 421

What is true about the relationship of K<sub>p</sub> and K<sub>c</sub> for the reaction:



- A)  $K_p < K_c$
- B)  $K_p = K_c$
- C)  $K_p > K_c$
- D)  $K_p$  and  $K_c$  are not related.

Answer: <https://biology-forums.com/index.php?topic=290503>

### Question 422

What is the molarity of a solution prepared by dissolving 0.80 g of NaOH in enough water to make 250 mL of solution?

Answer: <https://biology-forums.com/index.php?topic=289338>

### Question 423

When 220. mL of  $1.50 \times 10^{-4}$  M hydrochloric acid is added to 125 mL of  $1.75 \times 10^{-4}$  M  $Mg(OH)_2$ , the resulting solution will be

- A) acidic.
- B) basic
- C) neutral.
- D) It is impossible to tell from the information given.

Answer: <https://biology-forums.com/index.php?topic=289337>

### Question 424

Which ion does not have a noble gas configuration in its ground state?

- A)  $Si^{4+}$
- B)  $Sc^{3+}$
- C)  $Zn^{2+}$
- D)  $Se^{2-}$

Answer: <https://biology-forums.com/index.php?topic=289529>

### Question 425

How many significant figures are there in the answer for the following problem?

$$23.1 + 0.5588 + 17 = ?$$

- A) one
- B) two
- C) three
- D) four

Answer: <https://biology-forums.com/index.php?topic=288831>

### Question 426

Carbon dioxide is a gas which causes environmental concern because of the greenhouse effect. What is the approximate percentage (by volume) of  $CO_2$  in the atmosphere?

- A) 0.040%
- B) about 3%
- C) about 8%
- D) more than 15%

Answer: <https://biology-forums.com/index.php?topic=289990>

### Question 427

If one mole of each is dissolved in 1.00 L of water, which will lower the vapor pressure the most?

- A)  $C_{12}H_{22}O_{11}$
- B)  $KNO_3$
- C)  $C_3H_7OH$
- D)  $MgCl_2$

Answer: <https://biology-forums.com/index.php?topic=290310>

### Question 428

The solid compound,  $Na_2CO_3$ , contains

- A)  $Na^+$ ,  $C_4^{+}$ , and  $O_2^-$  ions.
- B)  $Na^+$  ions and  $CO_3^{2-}$  ions.
- C)  $Na_2^+$  and  $CO_3^{2-}$  ions.
- D)  $Na_2CO_3$  molecules.

Answer: <https://biology-forums.com/index.php?topic=288917>

### Question 429

The osmotic pressure of a 100-mL solution containing 1.0 g of sucrose, C<sub>12</sub>H<sub>22</sub>O<sub>11</sub> will be \_\_\_\_\_ (equal to, greater than, less than) the osmotic pressure of a 100-mL solution containing 1.0 g of fructose, C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>.

Answer: <https://biology-forums.com/index.php?topic=290347>

### Question 430

What is the highest possible oxidation state for vanadium?

- A) +2
- B) +3
- C) +4
- D) +5

Answer: <https://biology-forums.com/index.php?topic=291560>

### Question 431

Using the conjugate acid-base pairs listed below, complete the following equation with the pair that gives an equilibrium constant  $K_c > 1$ .

\_\_\_\_\_ + HSO<sub>3</sub><sup>-</sup> <--> \_\_\_\_\_ + H<sub>2</sub>SO<sub>3</sub>

- A) CH<sub>3</sub>CO<sub>2</sub>H/ CH<sub>3</sub>CO<sub>2</sub><sup>-</sup>
- B) HCO<sub>2</sub>H/ HCO<sub>2</sub><sup>-</sup>
- C) HNO<sub>2</sub>/NO<sub>2</sub><sup>-</sup>
- D) HNO<sub>3</sub>/NO<sub>3</sub><sup>-</sup>

Answer: <https://biology-forums.com/index.php?topic=290642>

### Question 432

How many grams of H<sub>2</sub> gas are there in a 5.00-L cylinder at 4.00 × 10<sup>3</sup> mm Hg and 23°C?

- A) 1.08 g
- B) 2.16 g
- C) 0.542 g
- D) 823 g

Answer: <https://biology-forums.com/index.php?topic=289941>

### Question 433

Para-Aminobenzoic acid (PABA), p-H<sub>2</sub>N-C<sub>6</sub>H<sub>4</sub>(COOH), is used in some sunscreens and hair conditioning products. Calculate the pH of an aqueous solution with [PABA] = 0.030 M and  $K_a = 2.2 \times 10^{-5}$ .

- A) 1.52
- B) 3.09
- C) 4.66
- D) 6.18

Answer: <https://biology-forums.com/index.php?topic=290689>

### Question 434

Which of the following are allowed resonance forms of NCS-?

- I [ : N C — : ] – and [ : = C = : ] –
- II [ : N C — : ] – and [ : N C = : ] –
- III [ : N C — : ] – and [ : — C N : ] –

- A) only I
- B) only II
- C) only III
- D) I and III

Answer: <https://biology-forums.com/index.php?topic=289617>

### Question 435

Give the electronic configuration for Mn<sup>2+</sup>.

- A) [Ar]2s<sup>2</sup>2p<sup>6</sup>3d<sup>5</sup>
- B) [Ar]4s<sup>2</sup>3d<sup>3</sup>
- C) [Ar]4s<sup>1</sup>3d<sup>4</sup>
- D) [Ar]3d<sup>5</sup>

Answer: <https://biology-forums.com/index.php?topic=289530>



### Question 436

Which is the most acceptable electron dot structure for  $N_2H_2$ ?

- A) H — — — H
- B) H — = — H
- C) H — N — N — H
- D) H — — — H

Answer: <https://biology-forums.com/index.php?topic=289608>

### Question 437

Which of the following statements concerning the rusting of iron is false?

- A) The oxidation site can occur at a different place on the metal surface than the reduction site.
- B) The metal is reduced.
- C) The rusting of iron requires both oxygen and water.
- D) Salt increases the rate of corrosion by providing ions to carry the current.

Answer: <https://biology-forums.com/index.php?topic=291155>

### Question 438

What statement is not consistent with the chemistry of tin?

- A) It is abstracted from the mineral cassiterite by reduction of the oxide with carbon.
- B) It is an important component of alloys such as bronze, pewter, and some solders.
- C) It is a relatively abundant ore within the earth's crust.
- D) It is used as a protective coating over steel in making tin cans.

Answer: <https://biology-forums.com/index.php?topic=291754>

### Question 439

What volume of 0.100 M NaOH is needed to make 100.0 mL of a buffer solution with a pH of 6.00 if one starts with 50.0 mL of 0.100 M potassium hydrogen phthalate? The  $K_{a2}$  for potassium hydrogen phthalate is  $3.1 \times 10^{-6}$ .

- A) 22.4 mL
- B) 27.6 mL
- C) 30.2 mL
- D) 37.8 mL

Answer: <https://biology-forums.com/index.php?topic=290840>

### Question 440

A piece of plastic weighing 1.157 g has a volume of 1.48 cm<sup>3</sup>. A piece of wood has the same volume but weighs 3.85 g. The density of liquid X is 0.765 g/mL and the density of liquid Z is 1.13 g/mL. The two liquids are immiscible. If the plastic and wood are added to the two liquids, what is the order of layers from top to bottom in the container?

- A) liquid X, liquid Z, plastic, wood
- B) liquid X, plastic, liquid Z, wood
- C) plastic, wood, liquid Z, liquid X
- D) wood, liquid Z, plastic, liquid X

Answer: <https://biology-forums.com/index.php?topic=288764>

### Question 441

Which of the following underlined items is not an extensive property?

- A) the color of a cobalt compound
- B) the diameter of a gold nugget
- C) the mass of a diamond
- D) the volume of a glucose solution

Answer: <https://biology-forums.com/index.php?topic=288957>

### Question 442

What is the pH of a 0.020 M  $Ba(OH)_2$  solution?

- A) 1.40
- B) 1.70
- C) 12.30
- D) 12.60

Answer: <https://biology-forums.com/index.php?topic=290762>

### Question 443

What is the anhydride of sulfuric acid?

- A) SO<sub>2</sub>
- B) SO<sub>3</sub>
- C) S<sub>2</sub>O<sub>3</sub>
- D) S<sub>2</sub>O<sub>5</sub>

Answer: <https://biology-forums.com/index.php?topic=291820>

### Question 444

A molecular compound that obeys the octet rule in which all atoms have a zero formal charge is

- A) SrBr<sub>2</sub>.
- B) BrF<sub>3</sub>.
- C) NH<sub>3</sub>.
- D) XeF<sub>4</sub>.

Answer: <https://biology-forums.com/index.php?topic=289648>

### Question 445

In which of the following sets do all species have the same number of protons?

- A) Br<sup>-</sup>, Kr, Rb<sup>2+</sup>
- B) C, N<sup>3-</sup>, O<sup>2-</sup>
- C) Mg<sup>2+</sup>, Ca<sup>2+</sup>, Ba<sup>2+</sup>
- D) O, O<sup>2-</sup>, O<sup>2+</sup>

Answer: <https://biology-forums.com/index.php?topic=288999>

### Question 446

Iron crystallizes in a body-centered cubic cell having an edge length of 287 pm. What is the density of iron in g/cm<sup>3</sup>?

- A) 1.99
- B) 7.85
- C) 11.9
- D) 15.9

Answer: <https://biology-forums.com/index.php?topic=290104>

### Question 447

What is the hydronium ion concentration and the pH for an aqueous solution of NH<sub>3</sub> that has a hydroxide ion concentration of  $2.25 \times 10^{-3}$  M?

- A)  $4.44 \times 10^{-11}$  M, 3.65
- B)  $4.44 \times 10^{-11}$  M, 10.35
- C)  $4.44 \times 10^{-12}$  M, 2.65
- D)  $4.44 \times 10^{-12}$  M, 11.35

Answer: <https://biology-forums.com/index.php?topic=290662>

### Question 448

Which of the following regions of the earth's atmosphere contains the ozone layer?

- A) mesosphere
- B) stratosphere
- C) thermosphere
- D) troposphere

Answer: <https://biology-forums.com/index.php?topic=289982>

### Question 449

Lithium reacts with oxygen to form an oxide with the formula \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291905>

### Question 450

Which of the compounds, CaH<sub>2</sub>, H<sub>2</sub>O, CH<sub>4</sub>, XeF<sub>4</sub> are ionic compounds?

- A) only CH<sub>4</sub>
- B) only CaH<sub>2</sub>
- C) CaH<sub>2</sub> and XeF<sub>4</sub>
- D) H<sub>2</sub>O, CH<sub>4</sub>, and XeF<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289006>

### Question 451

When dissolved in water, LiOH behaves as

- A) an acid that forms Li<sup>+</sup> and OH<sup>-</sup> ions.
- B) an acid that forms LiO<sup>-</sup> and H<sup>+</sup> ions.
- C) a base that forms Li<sup>+</sup> and OH<sup>-</sup> ions.
- D) a base that forms LiO<sup>-</sup> and H<sup>+</sup> ions.

Answer: <https://biology-forums.com/index.php?topic=289227>

### Question 452

Which metal exhibits the highest oxidation state in its compounds?

- A) Sc
- B) Cr
- C) Mn
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291535>

### Question 453

A student prepared a stock solution by dissolving 15.0 g of KOH in enough water to make 150. mL of solution. She then took 15.0 mL of the stock solution and diluted it with enough water to make water to make 65.0 mL of a final solution. What is the concentration of KOH for the final solution?

- A) 0.411 M
- B) 0.534 M
- C) 1.87 M
- D) 2.43 M

Answer: <https://biology-forums.com/index.php?topic=289285>

### Question 454

Is thermal energy a form of kinetic or potential molecular energy?

Answer: <https://biology-forums.com/index.php?topic=289891>

### Question 455

Which depends only on the initial and final state?

- A) q
- B) w
- C) q + w
- D) q - w

Answer: <https://biology-forums.com/index.php?topic=289781>

### Question 456

In the reaction between NO<sub>2</sub> and H<sub>2</sub>O that produces HNO<sub>3</sub>, the Lewis acid is \_\_\_\_\_ and the Lewis base is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290825>

### Question 457

How many liters of SO<sub>3</sub>(g) are produced at 25°C and 1.00 atm from the combustion of 1.00 kg of coal which is 1.00% S by weight? Assume all the sulfur in the coal ends up as SO<sub>3</sub>.

- A) 0.640 L
- B) 5.08 L
- C) 7.63 L
- D) 11.4 L

Answer: <https://biology-forums.com/index.php?topic=289954>

### Question 458

Predict the product(s) when the reactants Mg(s) + Cl<sub>2</sub>(l) are mixed.

- A) MgCl(s)
- B) MgCl<sub>2</sub>(s)
- C) Mg<sub>2</sub>Cl(s)
- D) MgCl<sub>3</sub>(s)

Answer: <https://biology-forums.com/index.php?topic=291870>

### Question 459

What is the total pressure in a 10.0 L flask which contains 0.200 mol of H<sub>2</sub>(g) and 0.215 mol of N<sub>2</sub>(g) at 20.0°C?

- A) 0.306 atm
- B) 0.681 atm
- C) 0.693 atm
- D) 0.998 atm

Answer: <https://biology-forums.com/index.php?topic=289958>

### Question 460

The reaction  $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{O}_2(\text{g})$  is endothermic 298 K. The effect of increasing the partial pressure of O<sub>2</sub> in the system at equilibrium will \_\_\_\_\_ (decrease, increase, have no effect on) the total quantity of CaCO<sub>3</sub> once equilibrium is reestablished.

Answer: <https://biology-forums.com/index.php?topic=290622>

### Question 461

What is the oxidation number of the sulfur atom in Li<sub>2</sub>SO<sub>4</sub>?

- A) -2
- B) +2
- C) +4
- D) +6

Answer: <https://biology-forums.com/index.php?topic=289319>

### Question 462

The product of the reaction of lithium with nitrogen is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291904>

### Question 463

Arrange the following spectral regions in order of increasing wavelength:

infrared, microwave, ultraviolet, visible.

- A) microwave < infrared < visible < ultraviolet
- B) microwave < visible < infrared < ultraviolet
- C) ultraviolet < infrared < visible < microwave
- D) ultraviolet < visible < infrared < microwave

Answer: <https://biology-forums.com/index.php?topic=289360>

### Question 464

Which of the following statements is not correct when balancing a nuclear equation?

- I. The mass numbers must be conserved on both sides of the reaction arrow.
- II. The ionic charges must be conserved on both sides of the reaction arrow.
- III. The atomic numbers must be conserved on both sides of the reaction arrow.
- IV. The elements must be the same on both sides of the reaction arrow.

- A) II only
- B) II and III
- C) I and III
- D) II and IV

Answer: <https://biology-forums.com/index.php?topic=291316>

### Question 465

What is the charge, n, in the ion Si<sub>4</sub>O<sub>10</sub><sup>n-</sup> that is found in talc?

- A) 2 -
- B) 4 -
- C) 8 -
- D) 10 -

Answer: <https://biology-forums.com/index.php?topic=291777>

### Question 466

What statement is inconsistent about graphite?

- A) Carbon sheets are separated by a distance of 335 pm and are held together by weak London dispersion forces.
- B) Electrical conductivity parallel to the planar sheets is 1020 times greater than the conductivity of diamond.

- C) Pi electrons are delocalized and free to move perpendicular to the plane of the hexagonal sheets.  
D) A two-dimensional sheetlike structure in which each C atom uses sp<sup>2</sup> hybrid orbitals.

Answer: <https://biology-forums.com/index.php?topic=291766>

### Question 467

What is the expected freezing point of a 0.50 m solution of K<sub>2</sub>SO<sub>4</sub> in water? K<sub>f</sub> for water is 1.86°C/m.

- A) -0.93°C  
B) -1.9°C  
C) -2.8°C  
D) -6.5°C

Answer: <https://biology-forums.com/index.php?topic=290312>

### Question 468

What statement is inconsistent concerning the correlation of the chemical compositions of the most common ores with the locations of their metals in the periodic table?

- A) Gold and the platinum-group metals (Ru, Os, Rh, Ir, Pd, and Pt) are sufficiently unreactive to occur commonly as the free metals.  
B) The early transition metals on the left side of the d block generally occur as oxides while the more electronegative, late transition metals on the right side of the d block occur as sulfides.  
C) The more electronegative p-block metals are commonly found as oxides and nitrates except for Al and Sn which are found as sulfides.  
D) The s-block metals are found in nature as carbonates, silicates and in the case of Na and K as chlorides.

Answer: <https://biology-forums.com/index.php?topic=291597>

### Question 469

What is the molecular structure of germanium that is used in semiconductors?

- A) body centered  
B) diamond-like  
C) graphite-like  
D) simple cubic

Answer: <https://biology-forums.com/index.php?topic=291762>

### Question 470

If the mass of one neutron is 1.00866 amu, the mass of one proton is 1.00728 amu, and the mass of <sup>12</sup>C nucleus is 11.99671 amu, calculate the binding energy for the <sup>12</sup>C nucleus.

- A)  $8.90 \times 10^9$  kJ/mol  
B)  $8.90 \times 10^{12}$  kJ/mol  
C)  $1.10 \times 10^{15}$  kJ/mol  
D)  $1.10 \times 10^{18}$  kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291371>

### Question 471

How many molecules of N<sub>2</sub> are in a 250.0 mL container at 780 mm Hg and 135°C?

- A)  $4.38 \times 10^{21}$  molecules  
B)  $4.62 \times 10^{21}$  molecules  
C)  $1.32 \times 10^{22}$  molecules  
D)  $1.39 \times 10^{22}$  molecules

Answer: <https://biology-forums.com/index.php?topic=289935>

### Question 472

The intensity of a beam of light is related to its

- A) frequency.  
B) relative number of photons.  
C) speed.  
D) wavelength.

Answer: <https://biology-forums.com/index.php?topic=289363>

### Question 473

An incorrect statement about the alkaline earth metals is

- A) Melting points generally decrease as one descends the group.  
B) Densities are less than those of the corresponding alkali elements of the same period.  
C) Ionic radii of the M<sup>2+</sup> ion increases as one descends the group.

D) The first ionization energy is less than that of the second ionization energy.

Answer: <https://biology-forums.com/index.php?topic=291730>

#### Question 474

A solution is prepared by dissolving 50.0 g of sucrose,  $C_{12}H_{22}O_{11}$ , in 250. g of water at  $25^{\circ}C$ . What is the vapor pressure of the solution if the vapor pressure of water at  $25^{\circ}C$  is 23.76 mm Hg?

- A) 0.247 mm Hg
- B) 19.8 mm Hg
- C) 23.5 mm Hg
- D) 24.0 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290307>

#### Question 475

A light emitting diode with a band gap of 181 kJ/mol emits light in what region of the electromagnetic radiation spectrum?

- A) infrared
- B) ultraviolet
- C) visible - blue
- D) visible - red

Answer: <https://biology-forums.com/index.php?topic=291636>

#### Question 476

Of the following, which has the shortest de Broglie wavelength?

- A) an airplane moving at a velocity of 350 mph
- B) a helium nucleus moving at a velocity of 800 mph
- C) a nitrogen molecule moving at a velocity of 900 mph
- D) a nitrogen molecule moving at a velocity of 5000 mph

Answer: <https://biology-forums.com/index.php?topic=289416>

#### Question 477

The horizontal rows of the periodic table are called

- A) groups.
- B) periods.
- C) triads.
- D) elements.

Answer: <https://biology-forums.com/index.php?topic=288866>

#### Question 478

Which one of the following statements about temperature scales is false?

- A) The boiling point of water on the Fahrenheit scale is 212 degrees.
- B) The Celsius degree is smaller than the Fahrenheit degree.
- C) The freezing point of water on the Celsius scale is 0 degrees.
- D) All temperatures on the Kelvin scale are positive numbers.

Answer: <https://biology-forums.com/index.php?topic=288749>

#### Question 479

The reaction for the decomposition of dinitrogen monoxide gas to form an oxygen radical is: . If the activation energy is 250 kJ/mol and the frequency factor is  $8.0 \times 10^{11} s^{-1}$ , what is the rate constant for the first-order reaction at 1000 K?

- A)  $1.1 \times 10^{-3} s^{-1}$
- B)  $7.0 \times 10^{-2} s^{-1}$
- C)  $1.6 \times 10^{13} s^{-1}$
- D)  $9.1 \times 10^{24} s^{-1}$

Answer: <https://biology-forums.com/index.php?topic=290398>

#### Question 480

Which of the following elements is a gas at room temperature?

- A) bromine
- B) iron
- C) krypton
- D) sodium

Answer: <https://biology-forums.com/index.php?topic=288950>

### Question 481

Molecules of a liquid can pass into the vapor phase only if the

- A) liquid has little surface tension.
- B) molecules have sufficient kinetic energy to overcome the intermolecular forces in the liquid.
- C) temperature of the liquid is near its boiling point.
- D) vapor pressure of the liquid is high.

Answer: <https://biology-forums.com/index.php?topic=290086>

### Question 482

The mass defect for the formation of lithium-6 is 0.0343 g/mol. The binding energy for lithium-6 nuclei is \_\_\_\_\_ kJ/mol.

Answer: <https://biology-forums.com/index.php?topic=291466>

### Question 483

Below the superconducting transition temperature  $T_c$ , superconductors

- A) become perfect conductors.
- B) become perfect magnets.
- C) become perfect resistors.
- D) fail to work.

Answer: <https://biology-forums.com/index.php?topic=291641>

### Question 484

Identify the compound that is an aldehyde.

- A) ethyl pentanoate
- B) butanal
- C) dimethyl ether
- D) 3-pentanone

Answer: <https://biology-forums.com/index.php?topic=291995>

### Question 485

First-order diffraction of X-rays with  $d = 154.2$  pm at an angle of  $32.5^\circ$  is caused by layers of atoms in a crystalline solid with a spacing of \_\_\_\_\_ pm.

Answer: <https://biology-forums.com/index.php?topic=290175>

### Question 486

Which of the following statements about isomers is false?

- A) All alkanes have branched chain isomers.
- B) As the number of carbon atoms increase in a compound, so do the number of possible isomers.
- C) Isomers have different physical properties.
- D) Isomers have the same formula but different molecular structures.

Answer: <https://biology-forums.com/index.php?topic=291937>

### Question 487

The number of atoms in 1 g of H is \_\_\_\_\_ (greater than, less than, the same as) the number of atoms in 12 g of C.

Answer: <https://biology-forums.com/index.php?topic=289056>

### Question 488

Which is the smallest quantity of pressure?

- A) 1 atm
- B) 1 centimeter of Hg
- C) 1 mm Hg
- D) 1 pascal

Answer: <https://biology-forums.com/index.php?topic=289914>

### Question 489

Which of the following statements about gamma radiation is false?

- A) It almost always accompanies alpha or beta emission.
- B) It is a mechanism to release excess energy in the nucleus.
- C) Gamma rays are high energy photons.

D) The mass number decreases by one with each gamma emitted.

Answer: <https://biology-forums.com/index.php?topic=291323>

### Question 490

Which bond should have the highest bond dissociation energy?

- A) N—N
- B) N N
- C) N N
- D) N—H

Answer: <https://biology-forums.com/index.php?topic=289584>

### Question 491

A reaction has the rate law  $\text{Rate} = k[\text{NO}]^2[\text{H}_2]$ . If the concentration of NO is reduced by half and the concentration of H<sub>2</sub> is quadrupled, the rate of reaction will \_\_\_\_\_ (increase, decrease, not change).

Answer: <https://biology-forums.com/index.php?topic=290466>

### Question 492

Which one of the following is not an empirical formula?

- A) CHO
- B) CH<sub>2</sub>O
- C) C<sub>3</sub>H<sub>6</sub>O
- D) C<sub>8</sub>H<sub>16</sub>O<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289182>

### Question 493

Using shorthand notation, the ground-state electron configuration for Sr<sup>2+</sup> is predicted to be \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289561>

### Question 494

When 2.36 g of a nonvolatile solute is dissolved in 100 g of solvent, the largest change in freezing point will be achieved when the solvent is

- A) paradichlorobenzene,  $K_f = 7.10$ .
- B) tert-butanol,  $K_f = 9.1$ .
- C) water,  $K_f = 1.86$ .
- D) All are expected to have the same freezing point.

Answer: <https://biology-forums.com/index.php?topic=290316>

### Question 495

A 3.17 m solution of CaCl<sub>2</sub> in water has a density of 1.24 g/mL. What is the molarity?

- A) 2.56 M CaCl<sub>2</sub>
- B) 2.91 M CaCl<sub>2</sub>
- C) 3.50 M CaCl<sub>2</sub>
- D) 3.93 M CaCl<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290228>

### Question 496

What are the possible values of n and ml for an electron in a 6d orbital?

- A) n = 1, 2, 3, 4, or 5 and ml = 2
- B) n = 1, 2, 3, 4, or 5 and ml = -2, -1, 0, +1, or +2
- C) n = 6 and ml = 2
- D) n = 6 and ml = -2, -1, 0, +1, or +2

Answer: <https://biology-forums.com/index.php?topic=289389>

### Question 497

Calcium, strontium, and barium are all prepared commercially by the same method which is

- A) electrolysis of the molten metal oxides.
- B) electrolysis of the molten metal halides.
- C) chemical reduction of the metal oxides with aluminium.
- D) chemical reduction of the metal halides with oxygen.

Answer: <https://biology-forums.com/index.php?topic=291734>



### Question 498

Which one of the following salts, when dissolved in water, produces the solution with the highest pH?

- A)  $\text{LiHSO}_4$
- B)  $\text{NaClO}_4$
- C)  $\text{KF}$
- D)  $\text{CH}_3\text{NH}_3\text{I}$

Answer: <https://biology-forums.com/index.php?topic=290795>

### Question 499

How much water must be added to 36.0 g of  $\text{CaCl}_2$  to produce a solution that is 35.0 wt%  $\text{CaCl}_2$ ?

- A) 48.6 g
- B) 66.9 g
- C) 97.2 g
- D) 103 g

Answer: <https://biology-forums.com/index.php?topic=290284>

### Question 500

Which one of the following is a pseudohalide?

- A)  $\text{CO}_3^{2-}$
- B)  $\text{OH}^-$
- C)  $\text{CN}^-$
- D)  $\text{SO}_4^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291773>

### Question 501

A  $\text{KCl}$  solution is prepared by dissolving 60.0 g  $\text{KCl}$  in 250.0 g of water at  $25^\circ\text{C}$ . What is the vapor pressure of the solution if the vapor pressure of water at  $25^\circ\text{C}$  is 23.76 mm Hg?

- A) 20.5 mm Hg
- B) 21.3 mm Hg
- C) 22.5 mm Hg
- D) 25.5 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290241>

### Question 502

The element in period 4 with the smallest first ionization energy is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289574>

### Question 503

Which of the following processes will decrease the neutron/ proton ratio?

- A) positron emission
- B) electron capture
- C) beta emission
- D) alpha emission

Answer: <https://biology-forums.com/index.php?topic=291354>

### Question 504

Methylamine  $\text{CH}_3\text{NH}_2$ , has a base dissociation constant of  $3.7 \times 10^{-4}$ . What is the conjugate acid of methylamine and what is its acid dissociation constant?

- A)  $\text{CH}_3\text{NH}_3^+$ ,  $2.7 \times 10^3$
- B)  $\text{CH}_3\text{NH}_3^+$ ,  $3.7 \times 10^{-4}$
- C)  $\text{CH}_3\text{NH}_3^+$ ,  $2.7 \times 10^{-11}$
- D)  $\text{CH}_3\text{NH}_2^-$ ,  $2.7 \times 10^{-11}$

Answer: <https://biology-forums.com/index.php?topic=290709>

### Question 505

The paramagnetism of  $\text{O}_2$  is explained by

- A) coordinate covalent bonding.
- B) molecular orbital theory.

- C) resonance.
- D) valence bond theory.

Answer: <https://biology-forums.com/index.php?topic=289700>

### Question 506

Electrical resistance of a metal \_\_\_\_\_ with increasing temperature.

- A) can decrease or increase
- B) decreases
- C) does not change
- D) increases

Answer: <https://biology-forums.com/index.php?topic=291621>

### Question 507

Diethyl ether has the molecular formula C<sub>4</sub>H<sub>10</sub>O. Which ball and stick model shown above represents diethyl ether? [gray spheres = C, black spheres = O, unshaded spheres = H]

- A) model a)
- B) model b)
- C) model c)
- D) model d)

Answer: <https://biology-forums.com/index.php?topic=289125>

### Question 508

A peptide bond links

- A) an alcohol and a ketone.
- B) an amine and an aldehyde.
- C) an amine and a carboxylic acid.
- D) an ester and a carboxylic acid.

Answer: <https://biology-forums.com/index.php?topic=292030>

### Question 509

How long must a constant current of 50.0 A be passed through an electrolytic cell containing aqueous Cu<sup>2+</sup> ions to produce 3.00 moles of copper metal?

- A) 0.311 hours
- B) 0.621 hours
- C) 1.61 hours
- D) 3.22 hours

Answer: <https://biology-forums.com/index.php?topic=291172>

### Question 510

Atomic radius of main-group elements generally

- A) increases from left to right across a period and increases down a group.
- B) increases from left to right across a period and decreases down a group.
- C) decreases from left to right across a period and increases down a group.
- D) decreases from left to right across a period and decreases down a group.

Answer: <https://biology-forums.com/index.php?topic=291714>

### Question 511

Rank the following elements in order of increasing effective nuclear charge: Na, Mg, Cl, and S.

- A) S < Cl < Mg < Na
- B) Cl < Mg < Na < S
- C) Mg < Na < Cl < S
- D) Na < Mg < Cl < S

Answer: <https://biology-forums.com/index.php?topic=289409>

### Question 512

What is geometry around the carbon atom labeled C2?

- A) bent
- B) tetrahedral
- C) trigonal planar
- D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289715>

### Question 513

The decomposition of ammonia is:  $2 \text{NH}_3(\text{g}) = \text{N}_2(\text{g}) + 3 \text{H}_2(\text{g})$ . If  $K_p$  is  $1.5 \times 10^3$  at  $400^\circ\text{C}$ , what is the partial pressure of ammonia at equilibrium when  $\text{N}_2$  is 0.40 atm and  $\text{H}_2$  is 0.15 atm?

- A)  $9.0 \times 10^{-7}$  atm
- B)  $9.5 \times 10^{-4}$  atm
- C)  $1.1 \times 10^3$  atm
- D)  $1.1 \times 10^6$  atm

Answer: <https://biology-forums.com/index.php?topic=290569>

### Question 514

What is the empirical formula of a substance that contains 12.0 g of C, 2.00 g of H, and 5.33 g of O?

- A)  $\text{C}_3\text{H}_6\text{O}$
- B)  $\text{C}_{15}\text{H}_{30}\text{O}_5$
- C)  $\text{C}_3\text{H}_5\text{O}_3$
- D)  $\text{C}_3\text{H}_4\text{O}_4$

Answer: <https://biology-forums.com/index.php?topic=289180>

### Question 515

Which of the compounds of  $\text{HNO}_2$ ,  $\text{Ra}(\text{OH})_2$ ,  $\text{FrOH}$ , and  $\text{HI}$ , behave as acids when they are dissolved in water?

- A)  $\text{Ra}(\text{OH})_2$  and  $\text{FrOH}$
- B)  $\text{HNO}_2$  and  $\text{HI}$
- C) only  $\text{HI}$
- D) only  $\text{FrOH}$

Answer: <https://biology-forums.com/index.php?topic=289307>

### Question 516

Which element of group 6A has the highest melting point?

- A) Ge
- B) As
- C) Po
- D) Se

Answer: <https://biology-forums.com/index.php?topic=291893>

### Question 517

Biological reactions are catalyzed by

- A) sugar.
- B) enzymes.
- C) fats.
- D) water.

Answer: <https://biology-forums.com/index.php?topic=290459>

### Question 518

A 0.50 M solution of a weak acid  $\text{HA}$  has the same pH as a 0.075 M solution of  $\text{HCl}$ . Calculate the  $K_a$  for  $\text{HA}$ .

- A) 0.50
- B) 0.075
- C) 0.1324
- D) 0.01125

Answer: <https://biology-forums.com/index.php?topic=290774>

### Question 519

Which atom in each group (I and II) has the smallest atomic radius?

(I)  $\text{Rb}$ ,  $\text{Zr}$ ,  $\text{I}$  (II)  $\text{Sb}$ ,  $\text{N}$ ,  $\text{As}$

- A)  $\text{Rb}$ ;  $\text{Sb}$
- B)  $\text{Rb}$ ;  $\text{As}$
- C)  $\text{Te}$ ;  $\text{Sb}$
- D)  $\text{Te}$ ;  $\text{As}$

Answer: <https://biology-forums.com/index.php?topic=289451>

### Question 520

Which of the following is a correct name for an alkyne?

- A) 3-methyl-2-octyne
- B) 8-methyl-3-octyne
- C) 2, 2-dimethyl-4-pentyne
- D) 3, 3-dimethyl-1-heptyne

Answer: <https://biology-forums.com/index.php?topic=292009>

### Question 521

A catalyst increases the rate of a reaction by providing a different reaction pathway that

- A) lowers only the activation energy.
- B) raises only the energy of the products.
- C) lowers only the energy of the reactants and products.
- D) All of these are affected by the presence of a catalyst.

Answer: <https://biology-forums.com/index.php?topic=290454>

### Question 522

If the reaction of phosphate ion with water is ignored, what is the total concentration of ions in a solution prepared by dissolving 3.00 g of  $\text{Na}_3\text{PO}_4$  in enough water to make 350. mL of solution?

- A) 0.0183 M
- B) 0.209 M
- C) 0.0523 M
- D) 0.323 M

Answer: <https://biology-forums.com/index.php?topic=289213>

### Question 523

A fuel cell is a galvanic cell in which the reactant is a fuel such as

- A) hydrogen.
- B) gasoline.
- C) ethane.
- D) propanol.

Answer: <https://biology-forums.com/index.php?topic=291245>

### Question 524

Which of the following volumes is equal to 60.0 mL?

- A) 60.0  $\text{cm}^3$
- B) 60.0  $\text{mm}^3$
- C) 0.600 L
- D) 0.000600 GL

Answer: <https://biology-forums.com/index.php?topic=288812>

### Question 525

Electrical conductivity in graphite is maximized

- A) parallel to the pi framework and parallel to the planar C atom framework.
- B) perpendicular to the pi framework and parallel to the planar C atom framework.
- C) parallel to the pi framework and perpendicular to the planar C atom framework.
- D) perpendicular to the pi framework and perpendicular to the planar C atom framework.

Answer: <https://biology-forums.com/index.php?topic=291767>

### Question 526

The VSEPR model predicts the O—S—O bond angle in  $\text{SO}_2$  to be

- A)  $90^\circ$ .
- B)  $109.5^\circ$ .
- C) less than  $120^\circ$  but greater than  $109.5^\circ$ .
- D)  $120^\circ$ .

Answer: <https://biology-forums.com/index.php?topic=289728>

### Question 527

Which cation in each set is expected to have the larger (more negative) hydration energy?

- I. Li<sup>+</sup> or Na<sup>+</sup>
- II. Rb<sup>+</sup> or Cu<sup>2+</sup>
- A) Li<sup>+</sup> in set I and Rb<sup>+</sup> in set II
- B) Li<sup>+</sup> in set I and Cu<sup>2+</sup> in set II
- C) Na<sup>+</sup> in set I and Rb<sup>+</sup> in set II
- D) Na<sup>+</sup> in set I and Cu<sup>2+</sup> in set II

Answer: <https://biology-forums.com/index.php?topic=290272>

### Question 528

Which has the highest Z<sub>eff</sub> for its valence electrons?

- A) Cs
- B) W
- C) Pb
- D) At

Answer: <https://biology-forums.com/index.php?topic=289430>

### Question 529

In general, metallic character

- A) increases down a column because the orbitals become more compact.
- B) decreases down a column because the orbitals become more compact.
- C) increases across a row because the effective nuclear charge increases.
- D) increases down a column because the orbitals become more diffuse.

Answer: <https://biology-forums.com/index.php?topic=291716>

### Question 530

A 1.8 mole sample of gas at STP has a \_\_\_\_\_ entropy than 1.8 mole of gas at 273 K and 835 mm Hg.

Answer: <https://biology-forums.com/index.php?topic=291058>

### Question 531

Which statement below regarding fatty acids is not correct? Fatty acids

- A) are always liquids.
- B) are long chain carboxylic acids.
- C) are usually unbranched chains.
- D) usually have an even number of carbon atoms.

Answer: <https://biology-forums.com/index.php?topic=291965>

### Question 532

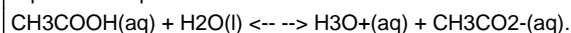
Red blood cells are placed into pure water. Which of the following statements is true?

- A) Water molecules flow out of the red blood cells, causing them to collapse.
- B) Water flows into the red blood cells, causing them to swell and burst.
- C) The osmotic pressure of the cell contents increases, causing the cells to burst.
- D) The osmotic pressure inside the cells equals the osmotic pressure outside.

Answer: <https://biology-forums.com/index.php?topic=290258>

### Question 533

Determine the acid dissociation constant for a 0.10 M acetic acid solution that has a pH of 2.87. Acetic acid is a weak monoprotic acid and the equilibrium equation of interest is



- A)  $1.3 \times 10^{-2}$
- B)  $1.3 \times 10^{-3}$
- C)  $1.8 \times 10^{-5}$
- D)  $1.8 \times 10^{-6}$

Answer: <https://biology-forums.com/index.php?topic=290681>

### Question 534

Carbon combines with some metals and semimetals to form carbides. What is the formula of aluminum carbide?

Answer: <https://biology-forums.com/index.php?topic=291911>

### Question 535

The number of unpaired electrons in tetrahedral NiBr<sub>4</sub><sup>2-</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291596>

### Question 536

What is the identity of element Q if the ion Q<sup>2+</sup> contains 10 electrons?

- A) C
- B) O
- C) Ne
- D) Mg

Answer: <https://biology-forums.com/index.php?topic=288913>

### Question 537

If the units for rate are M s<sup>-1</sup>, what are the units for the rate constant, k, if the overall order of the reaction is five?

- A) s
- B) M<sup>2</sup> s
- C) M<sup>-1</sup> s<sup>-1</sup>
- D) M<sup>-4</sup> s<sup>-1</sup>

Answer: <https://biology-forums.com/index.php?topic=290430>

### Question 538

All of the fatty acids below contain eighteen carbons and range from saturated to three double bonds. Which has the highest melting point?

- A) stearic acid (saturated)
- B) oleic acid (one double bond)
- C) linoleic acid (two double bonds)
- D) linolenic acid (three double bonds)

Answer: <https://biology-forums.com/index.php?topic=291966>

### Question 539

The estimated mass of the planet Jupiter is  $1.90 \times 10^{27}$  kg and the density is believed to be 1.34 g/cm<sup>3</sup>. If Jupiter were a perfect sphere, what would be its diameter?

- A)  $6.96 \times 10^6$  m
- B)  $6.96 \times 10^7$  m
- C)  $1.39 \times 10^7$  m
- D)  $1.39 \times 10^8$  m

Answer: <https://biology-forums.com/index.php?topic=288760>

### Question 540

The element that is in period 5 and group 2A has the symbol \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289043>

### Question 541

The balanced chemical equation for the production of silver by roasting of its sulfide is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291686>

### Question 542

Which of the following correctly ranks the following temperatures from smallest to largest?

23°C, 17°F, 273K, 1°C

- A) 23°C < 17°F < 273K < 1°C
- B) 1°C < 17°F < 23°C < 273K
- C) 273K < 23°C < 1°C < 17°F
- D) 17°F < 273K < 1°C < 23°C

Answer: <https://biology-forums.com/index.php?topic=288752>

### Question 543

The wavelength of light emitted by the GaP<sub>0.40</sub>As<sub>0.60</sub> LED, which has a band gap of 181 kJ/mol, is \_\_\_\_\_ nm.

Answer: <https://biology-forums.com/index.php?topic=291699>

### Question 544

A solution is prepared by dissolving 17.75 g sulfuric acid, H<sub>2</sub>SO<sub>4</sub>, in enough water to make 100.0 mL of solution. If the density of the solution is 1.1094 g/mL, what is the mole fraction H<sub>2</sub>SO<sub>4</sub> in the solution?

- A) 0.0181
- B) 0.0338
- C) 0.0350
- D) 19.0

Answer: <https://biology-forums.com/index.php?topic=290207>

### Question 545

Convert 98.6 cm<sup>3</sup> to m<sup>3</sup>.

- A)  $98.6 \times 10^{-4}$  m<sup>3</sup>
- B)  $98.6 \times 10^1$  m<sup>3</sup>
- C)  $98.6 \times 10^6$  m<sup>3</sup>
- D)  $98.6 \times 10^8$  m<sup>3</sup>

Answer: <https://biology-forums.com/index.php?topic=288813>

### Question 546

At STP the number of liters of O<sub>2</sub> required to react with 11.2 liters of CH<sub>4</sub> to form only CO<sub>2</sub> and H<sub>2</sub>O is \_\_\_\_\_ liters.

Answer: <https://biology-forums.com/index.php?topic=290059>

### Question 547

What is the first ionization energy for a hydrogen atom in the ground state? The Rydberg constant is .

- A)  $7.27 \times 10^{-36}$  J
- B)  $1.63 \times 10^{-27}$  J
- C)  $2.18 \times 10^{-18}$  J
- D) 0.00823 J

Answer: <https://biology-forums.com/index.php?topic=289367>

### Question 548

During an electrochemical reaction, electrons move through the external circuit toward the \_\_\_\_\_ and positive ions in the cell move toward the \_\_\_\_\_.

- A) anode, anode
- B) anode, cathode
- C) cathode, anode
- D) cathode, cathode

Answer: <https://biology-forums.com/index.php?topic=291091>

### Question 549

Elements in group 3A of the periodic table have the valence electron configuration \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291907>

### Question 550

The element Al can be found in period \_\_\_\_\_ and group \_\_\_\_\_ of the periodic table.

Answer: <https://biology-forums.com/index.php?topic=289042>

### Question 551

Radium occurs only in uranium ores, typically with an observed Ra/U ratio of 1mg/3kg. Uranium ores normally contain only about 200 ppm of U. How many kilograms of uranium ore must be processed to obtain 1 mg of radium?

- A) 1700 kg ore
- B) 15,000 kg ore
- C)  $6.0 \times 10^8$  kg ore
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=291417>

### Question 552

What is the de Broglie wavelength of a 300. g object moving at a velocity of 25.0 m/s (about 100 mph)?

- A)  $8.84 \times 10^{-41}$  m

- B)  $8.84 \times 10^{-35}$  m
- C)  $8.84 \times 10^6$  m
- D)  $8.84 \times 10^{12}$  m

Answer: <https://biology-forums.com/index.php?topic=289417>

### Question 553

Electronegativity of main-group elements generally

- A) increases from left to right across a period and increases down a group.
- B) increases from left to right across a period and decreases down a group.
- C) decreases from left to right across a period and increases down a group.
- D) decreases from left to right across a period and decreases down a group.

Answer: <https://biology-forums.com/index.php?topic=291713>

### Question 554

Which of the following three sets consist of atoms or ions with the same electron configuration in the ground state?

- (I)  $O^{2-}$ , Ne, and  $Mg^{2+}$
  - (II) Ni,  $Cu^+$ , and  $Zn^{2+}$
  - (III) Hg,  $Tl^+$ , and  $Pb^{2+}$
- A) all three sets
  - B) (II) and (III)
  - C) (I) and (III)
  - D) (I)

Answer: <https://biology-forums.com/index.php?topic=289474>

### Question 555

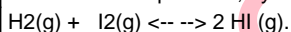
What is the de Broglie wavelength of an electron ( $m = 9.11 \times 10^{-31}$  kg) moving at a velocity of (10% of the speed of light)?

- A) less than  $3.9 \times 10^{-12}$  m
- B)  $2.4 \times 10^{-11}$  m
- C)  $3.3 \times 10^{-8}$  m
- D) greater than  $1.1 \times 10^{-4}$  m

Answer: <https://biology-forums.com/index.php?topic=289374>

### Question 556

At a certain temperature, hydrogen and iodine react to form hydrogen iodide:



When initial amounts of  $H_2$ ,  $I_2$ , and  $HI$  are mixed, the concentration of  $HI$  increases. Which statement below is true?

- A)  $K_c < Q$
- B)  $K_c > Q$
- C)  $K_c = Q$
- D) More information is needed to make a statement about  $K_c$ .

Answer: <https://biology-forums.com/index.php?topic=290577>

### Question 557

Sucrose, common table sugar, when hydrolyzed will form

- A) amylose and glycogen.
- B) cellulose and starch.
- C) glucose and fructose.
- D) lactose and maltose.

Answer: <https://biology-forums.com/index.php?topic=291954>

### Question 558

What is the oxidation number of the oxygen atom in  $O_2^{2-}$ ?

- A) -2
- B) -1
- C) +1
- D) +2

Answer: <https://biology-forums.com/index.php?topic=289322>

### Question 559

What is the molar solubility of  $AgCl$  in 0.50 M  $NaCN$  if the colorless complex ion  $Ag(CN)_2^-$  forms?  $K_{sp}$  for  $AgCl$  is  $1.8 \times 10^{-10}$  and  $K_f$  for  $Ag(CN)_2^-$  is



1.0 × 10<sup>21</sup>.

- A) 0.25 M
- B) 0.50 M
- C) 1.0 M
- D) 2.0 M

Answer: <https://biology-forums.com/index.php?topic=290927>

### Question 560

A steel bottle contains argon gas at STP. What is the final pressure if the temperature is changed to 125°C?

- A) 0.686 atm
- B) 0.748 atm
- C) 1.34 atm
- D) 1.46 atm

Answer: <https://biology-forums.com/index.php?topic=290004>

### Question 561

Which process decreases the neutron/proton ratio?

- A) alpha emission
- B) beta emission
- C) electron capture
- D) positron emission

Answer: <https://biology-forums.com/index.php?topic=291350>

### Question 562

The most acidic oxides of the group 5A elements are oxides of the element \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291919>

### Question 563

Which one of the following is an electrical insulator?

- A) alumina
- B) germanium doped with antimony
- C) gold
- D) tellurium

Answer: <https://biology-forums.com/index.php?topic=291624>

### Question 564

Zinc occurs in sulfide ores. How many liters of SO<sub>2</sub>(g) are produced at STP for each kilogram of roasted ore that is 70% zinc sulfide?

- A) 160 L
- B) 230 L
- C) 460 L
- D) 660 L

Answer: <https://biology-forums.com/index.php?topic=291611>

### Question 565

Which has a dipole moment?

- A) CF<sub>4</sub>
- B) SiO<sub>3</sub><sup>2-</sup>
- C) SO<sub>2</sub>
- D) SO<sub>4</sub><sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=289740>

### Question 566

The equilibrium constant, K<sub>p</sub>, equals 3.40 at 25°C for the isomerization reaction:

cis-2-butene  $\leftrightarrow$  trans-2-butene.

If a flask initially contains 1.00 atm of each gas, in what direction will the system shift to reach equilibrium?

- A) It will shift left.
- B) It will shift right.
- C) The system is already at equilibrium.
- D) The system is not at equilibrium and will remain in an unequilibrated state.

Answer: <https://biology-forums.com/index.php?topic=290521>

### Question 567

Elements with \_\_\_\_\_ atomic mass are best possible candidates for a fusion reaction.

- A) very low
- B) moderate
- C) moderate to heavy
- D) very heavy

Answer: <https://biology-forums.com/index.php?topic=291379>

### Question 568

An experiment with  $^{55}\text{Co}$  takes 47.5 hours. At the end of the experiment, 1.90 ng of  $^{55}\text{Co}$  remains. If the half life is 18.0 hours, how many ng of  $^{55}\text{Co}$  were originally present?

- A) 2.47 ng
- B) 3.05 ng
- C) 3.28 ng
- D) 11.8 ng

Answer: <https://biology-forums.com/index.php?topic=291362>

### Question 569

Which ion does not have a noble gas configuration in its ground state?

- A)  $\text{Sc}^{3+}$
- B)  $\text{Al}^{3+}$
- C)  $\text{Zn}^{2+}$
- D)  $\text{Te}^{2-}$

Answer: <https://biology-forums.com/index.php?topic=289528>

### Question 570

A basketball is inflated to a pressure of 1.80 atm in a  $23.0^\circ\text{C}$  garage. What is the pressure of the basketball outside where the temperature is  $-2.00^\circ\text{C}$ ?

- A) 1.65 atm
- B) 1.70 atm
- C) 1.90 atm
- D) 1.97 atm

Answer: <https://biology-forums.com/index.php?topic=289993>

### Question 571

In an acid-base neutralization reaction 43.74 mL of 0.500 M potassium hydroxide reacts with 50.00 mL of sulfuric acid solution. What is the concentration of the  $\text{H}_2\text{SO}_4$  solution?

- A) 0.219 M
- B) 0.437 M
- C) 0.875 M
- D) 1.14 M

Answer: <https://biology-forums.com/index.php?topic=289336>

### Question 572

Keratin is found in

- A) cells.
- B) bird feathers.
- C) muscles.
- D) DNA.

Answer: <https://biology-forums.com/index.php?topic=292026>

### Question 573

At  $20^\circ\text{C}$  and 0.28 atm pressure Xenon has a solubility in water of 1.4 mmol/L. What is the Henry's Law-constant in mol/L•atm at  $20^\circ\text{C}$ ?

Answer: <https://biology-forums.com/index.php?topic=290335>

### Question 574

"Equal volumes of different gases at the same temperature and pressure contain the same molar amounts" is another way of stating

- A) Avogadro's law.
- B) Boyle's law.

- C) Charles' law.
- D) Graham's law.

Answer: <https://biology-forums.com/index.php?topic=289926>

### Question 575

Carbon-14, which is present in all living tissue, radioactively decays via a first-order process. A one-gram sample of wood taken from a living tree gives a rate for carbon-14 decay of 13.6 counts per minute. If the half-life for carbon-14 is 5715 years, how old is a wood sample that gives a rate for carbon-14 decay of 7.9 counts per minute?

- A)  $2.2 \times 10^3$  yr
- B)  $3.1 \times 10^3$  yr
- C)  $4.5 \times 10^3$  yr
- D)  $1.4 \times 10^4$  yr

Answer: <https://biology-forums.com/index.php?topic=291454>

### Question 576

When ethylene glycol, HOCH<sub>2</sub>CH<sub>2</sub>OH, is added to the water in an automobile radiator, the effect is to

- A) lower the boiling point and lower the freezing point.
- B) lower the boiling point and raise the freezing point.
- C) raise the boiling point and lower the freezing point.
- D) raise the boiling point and raise the freezing point.

Answer: <https://biology-forums.com/index.php?topic=290255>

### Question 577

What is the identity of M in the hydrate M(H<sub>2</sub>O)<sub>6n</sub> that has the 0.10 M solution with the highest pH?

- A) Li<sup>+</sup>
- B) Na<sup>+</sup>
- C) Mg<sup>2+</sup>
- D) Al<sup>3+</sup>

Answer: <https://biology-forums.com/index.php?topic=290720>

### Question 578

Analysis of a 1.000-g sample of the oral hypoglycemic agent metformin<sup>TM</sup> yielded 0.3720 g of carbon, 0.0858 g of hydrogen, and 0.5422 g of nitrogen. Metformin<sup>TM</sup> has a molar mass of 129.16 g/mol. What is the molecular formula of Metformin<sup>TM</sup>?

Answer: <https://biology-forums.com/index.php?topic=289204>

### Question 579

What is the oxidation number of oxygen in KO<sub>2</sub>?

- A) 0
- B) -1/2
- C) -1
- D) -2

Answer: <https://biology-forums.com/index.php?topic=291811>

### Question 580

What structural features appear necessary for superconductivity in the 1-2-3 YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> superconductor?

- A) high metallic character
- B) infinite extended layers of Cu and O atoms and a fractional oxidation state for Cu
- C) presence of an inner transition element
- D) All of these are necessary.

Answer: <https://biology-forums.com/index.php?topic=291643>

### Question 581

What is geometry around the carbon atom labeled C1?

- A) bent
- B) tetrahedral
- C) trigonal planar
- D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289714>

### Question 582

Which statement below regarding the half-life of a second-order reaction is true?

- A) Each half-life is half as long as the preceding one.
- B) Each half-life is twice as long as the preceding one.
- C) Each half-life is four times as long as the preceding one.
- D) The length of the half-life remains unchanged throughout the course of the reaction.

Answer: <https://biology-forums.com/index.php?topic=290386>

### Question 583

What does the term "critical mass" mean? It is the

- A) amount of fissionable material which will self-sustain a nuclear chain reaction.
- B) difference between mass of individual protons and neutrons and the mass of the nucleus.
- C) energy which holds the nucleus together.
- D) mass of fuel in a nuclear reactor core.

Answer: <https://biology-forums.com/index.php?topic=291382>

### Question 584

The dissociation equilibrium constants for the protonated form of alanine (a diprotic amino acid  $H_2X^+$ ) are  $K_{a1} = 4.6 \times 10^{-3}$  and  $K_{a2} = 2.0 \times 10^{-10}$ . What is the pH of 50.00 mL of a 0.100 M solution of alanine after 100.00 mL of 0.100 M NaOH has been added?

- A) 9.70
- B) 10.69
- C) 11.11
- D) 12.70

Answer: <https://biology-forums.com/index.php?topic=290868>

### Question 585

Which of the following is a peroxide?

- A)  $Li_2O$
- B)  $K_2O_2$
- C)  $CaO$
- D)  $CsO_2$

Answer: <https://biology-forums.com/index.php?topic=291810>

### Question 586

Which statement is true for a reaction with  $K_c$  equal to  $8.90 \times 10^{-12}$ ?

- A) Increasing the temperature will not change the value of  $K_c$ .
- B) There are appreciable concentrations of both reactants and products.
- C) The reaction proceeds hardly at all towards completion.
- D) The reaction proceeds nearly all the way to completion.

Answer: <https://biology-forums.com/index.php?topic=290585>

### Question 587

What is the empirical formula of benzene,  $C_6H_6$ ?

Answer: <https://biology-forums.com/index.php?topic=289201>

### Question 588

Dissolving 0.040 mole of which of the following in enough water to make 0.220 L of solution would result in a solution with the highest pH?

- A)  $LiH$
- B)  $SrH_2$
- C)  $NH_3$
- D)  $PH_3$

Answer: <https://biology-forums.com/index.php?topic=291864>

### Question 589

The observation that 15.0 g of hydrogen reacts with 120.0 g of oxygen to form 135.0 g of water is evidence for the law of

- A) definite proportions.
- B) energy conservation.
- C) mass conservation.

D) multiple proportions.

Answer: <https://biology-forums.com/index.php?topic=288876>

### Question 590

Which of the following forms a metallic solid?

- A) gold
- B) potassium bromide
- C) quartz
- D) plastic

Answer: <https://biology-forums.com/index.php?topic=290152>

### Question 591

The balanced equation for the solubility equilibrium of  $\text{Ba}(\text{OH})_2$  is shown below. What is the equilibrium constant expression for the  $K_{sp}$  of  $\text{Ba}(\text{OH})_2$ ?



- A)  $K_{sp} = \frac{[\text{Ba}^{2+}][\text{OH}^{-}]^2}{[\text{Ba}(\text{OH})_2][\text{H}_2\text{O}]}$
- B)  $K_{sp} = \frac{[\text{Ba}^{2+}][\text{OH}^{-}]^2}{[\text{Ba}(\text{OH})_2]}$
- C)  $K_{sp} = [\text{Ba}^{2+}][\text{OH}^{-}]^2$
- D)  $K_{sp} = 1/([\text{Ba}^{2+}][\text{OH}^{-}]^2)$

Answer: <https://biology-forums.com/index.php?topic=290917>

### Question 592

What is the strongest monoprotic acid of the following set if all the acids are at 0.100 M concentration?

- A) hydrofluoric acid with  $K_a = 3.5 \times 10^{-4}$
- B) benzoic acid with  $K_a = 6.5 \times 10^{-5}$
- C) acetic acid with  $K_a = 1.8 \times 10^{-5}$
- D) hypochlorous acid with  $K_a = 3.5 \times 10^{-8}$

Answer: <https://biology-forums.com/index.php?topic=290686>

### Question 593

\_\_\_\_\_ does not combine with any other element.

- A) Chlorine
- B) Nitrogen
- C) Helium
- D) Krypton

Answer: <https://biology-forums.com/index.php?topic=288942>

### Question 594

According to the kinetic molecular theory, the pressure of a gas in a container will decrease if the

- A) number of collisions with the container wall increases.
- B) number of moles of the gas increases.
- C) temperature of the gas decreases.
- D) volume of the container decreases.

Answer: <https://biology-forums.com/index.php?topic=289967>

### Question 595

What is the pH of a 0.10 M  $\text{H}_2\text{Se}$  solution that has the stepwise dissociation constants  $K_{a1} = 1.3 \times 10^{-4}$  and  $K_{a2} = 1.0 \times 10^{-11}$ ?

- A) 2.44
- B) 3.89
- C) 4.89
- D) 5.50

Answer: <https://biology-forums.com/index.php?topic=290701>

### Question 596

The effects of ionizing radiation depend on

- A) length of exposure to radiation.
- B) location of source (internal or external).
- C) type and energy of radiation.
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=291403>

### Question 597

Using shorthand notation, the electron configuration of  $\text{Co}^{3+}$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291580>

### Question 598

The pH of 0.150 M  $\text{CH}_3\text{CO}_2\text{H}$ , acetic acid, is 2.78. What is the value of  $K_a$  for acetic acid?

- A)  $2.8 \times 10^{-6}$
- B)  $1.9 \times 10^{-5}$
- C)  $1.7 \times 10^{-3}$
- D)  $1.1 \times 10^{-2}$

Answer: <https://biology-forums.com/index.php?topic=290685>

### Question 599

What type of bonding is found in the compound  $\text{NH}_3$ ?

- A) covalent bonding
- B) hydrogen bonding
- C) ionic bonding
- D) metallic bonding

Answer: <https://biology-forums.com/index.php?topic=289003>

### Question 600

Dihydrogen phosphate  $\text{H}_2\text{PO}_4^-$ , has an acid dissociation constant of  $6.2 \times 10^{-7}$ . What is the conjugate base of  $\text{H}_2\text{PO}_4^-$  and what is its base dissociation constant?

- A)  $\text{H}_3\text{PO}_4$ ,  $1.6 \times 10^6$
- B)  $\text{H}_3\text{PO}_4$ ,  $1.6 \times 10^{-8}$
- C)  $\text{HPO}_4^{2-}$ ,  $1.6 \times 10^6$
- D)  $\text{HPO}_4^{2-}$ ,  $1.6 \times 10^{-8}$

Answer: <https://biology-forums.com/index.php?topic=290711>

### Question 601

What are the C–C–C bond angles in cyclopropane and cyclohexane?

- A)  $60^\circ$  in both molecules
- B)  $60^\circ$  in cyclopropane and  $109.5^\circ$  in cyclohexane
- C)  $60^\circ$  in cyclopropane and  $120^\circ$  in cyclohexane
- D)  $109.5^\circ$  in both molecules

Answer: <https://biology-forums.com/index.php?topic=291942>

### Question 602

A reaction reaches dynamic equilibrium at a given temperature when

- A) the amount of products exceeds the amount of reactants.
- B)  $k_{\text{fwd}}$  equals  $k_{\text{rev}}$ .
- C) opposing reactions cease and the system is static.
- D) the relative amounts of reactants and products are constant and  $\text{rate}_{\text{fwd}} = \text{rate}_{\text{rev}}$ .

Answer: <https://biology-forums.com/index.php?topic=290559>

### Question 603

If 100. mL of 0.200 M  $\text{Na}_2\text{SO}_4$  is added to 200. mL of 0.300 M  $\text{NaCl}$ , what is the concentration of  $\text{Na}^+$  ions in the final solution? Assume that the volumes are additive.

- A) 0.267 M
- B) 0.333 M
- C) 0.500 M
- D) 0.700 M

Answer: <https://biology-forums.com/index.php?topic=289317>

### Question 604

The artist's pigment cadmium yellow,  $\text{CdS}$ , has a water solubility of 0.13 g/L. The solubility product of  $\text{CdS}$ ,  $K_{\text{sp}} =$  \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290951>

### Question 605

Which of the following should have the largest dipole moment?

- A) F<sub>2</sub>(g)
- B) SO<sub>2</sub>(g)
- C) RbBr(g)
- D) CH<sub>2</sub>I<sub>2</sub>(g)

Answer: <https://biology-forums.com/index.php?topic=289742>

### Question 606

At a given temperature and pressure, which of the following would be expected to have the greatest molar entropy?

- A) F<sub>2</sub> (s)
- B) F<sub>2</sub> (l)
- C) F<sub>2</sub> (g)
- D) All of these would be expected to have the same molar entropy.

Answer: <https://biology-forums.com/index.php?topic=289878>

### Question 607

The number of protons, neutrons, and total nucleons in Ru are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=291455>

### Question 608

The output of a pendant manufacturer is 4335 pounds per week. If each pendant weighs 0.0133 pounds, how many pendants does the manufacturer make in one day?

- A) 2,282,000
- B) 324,700
- C) 58
- D) 46,560

Answer: <https://biology-forums.com/index.php?topic=288841>

### Question 609

The solubility of gaseous solutes in liquid solvents is greater when the

- A) external pressure over the solution is increased.
- B) external pressure is decreased.
- C) partial pressure of the gas above the solution is increased.
- D) partial pressure of the solvent is increased.

Answer: <https://biology-forums.com/index.php?topic=290236>

### Question 610

A container filled with gas is connected to an open-end manometer that is filled with mineral oil. The pressure in the gas container is 763 mm Hg and atmospheric pressure is 734 mm. How high will the level rise in the manometer if the densities of Hg and mineral oil are 13.6 g/mL and 0.822 g/mL respectively?

- A) 1.75 mm
- B) 23.8 mm
- C) 29.0 mm
- D) 480 mm

Answer: <https://biology-forums.com/index.php?topic=289989>

### Question 611

What volume of 5.00 × 10<sup>-3</sup> M HNO<sub>3</sub> is needed to titrate 20.00 mL of 5.00 × 10<sup>-3</sup> M Ca(OH)<sub>2</sub> to the equivalence point?

- A) 2.50 mL
- B) 10.0 mL
- C) 20.0 mL
- D) 40.0 mL

Answer: <https://biology-forums.com/index.php?topic=290904>

### Question 612

For hydrogen, what is the wavelength of the photon emitted when an electron drops from a 4d orbital to a 2p orbital in a hydrogen atom? The Rydberg constant is 1.097 × 10<sup>-2</sup> nm<sup>-1</sup>.

- A) 656.3 nm
- B) 486.2 nm
- C) 364.6 nm
- D)  $2.057 \times 10^{-3}$  nm

Answer: <https://biology-forums.com/index.php?topic=289415>

### Question 613

The first ionization energy of gallium is greater than that of aluminum and the first ionization energy of thallium is greater than that of indium. A possible explanation for this is

- A) This is the normal trend in ionization energy.
- B) Both Ga and Tl prefer to lose three electrons rather than one.
- C) Both Ga and Tl follow transition elements which are excellent shielders of nuclear charge.
- D) Ga follows a series of transition elements and Tl follows both a series of transition elements and inner transition elements which are poor shielders of nuclear charge.

Answer: <https://biology-forums.com/index.php?topic=291740>

### Question 614

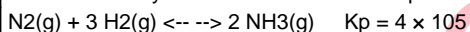
Dinitrogen monoxide gas decomposes to form nitrogen gas and oxygen gas. How many grams of nitrogen are formed when 30.00 g of dinitrogen monoxide decomposes?

- A) 9.545 g
- B) 19.09 g
- C) 30.00 g
- D) 60.00 g

Answer: <https://biology-forums.com/index.php?topic=289153>

### Question 615

The chemical system shown below is at equilibrium. Which change in conditions will not result in a spontaneous forward reaction?



- A) adding a catalyst
- B) adding more  $\text{N}_2$
- C) decreasing the  $\text{NH}_3$
- D) increasing the pressure

Answer: <https://biology-forums.com/index.php?topic=291020>

### Question 616

What is the pH of a 0.020 M RbOH solution?

- A) 0.020
- B) 0.040
- C) 1.70
- D) 12.30

Answer: <https://biology-forums.com/index.php?topic=290769>

### Question 617

White tin is the high temperature form of the metal. Given that the density of gray tin is 5.769 g/cm<sup>3</sup> and that of white tin is 7.28 g/cm<sup>3</sup> raising the pressure will favor the

- A) more dense allotrope and lower the transition temperature of 13.2°C.
- B) more dense allotrope and raise the transition temperature of 13.2°C.
- C) less dense allotrope and lower the transition temperature of 13.2°C.
- D) less dense allotrope and raise the transition temperature of 13.2°C.

Answer: <https://biology-forums.com/index.php?topic=291760>

### Question 618

The oxidation numbers of nitrogen in  $\text{NH}_4\text{NO}_3$  are \_\_\_\_\_ and \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291920>

### Question 619

What is the selenide ion concentration  $[\text{Se}^{2-}]$  for a 0.100 M  $\text{H}_2\text{Se}$  solution that has the stepwise dissociation constants of  $K_{a1} = 1.3 \times 10^{-4}$  and  $K_{a2} = 1.0 \times 10^{-11}$ ?

- A)  $3.6 \times 10^{-3}$  M
- B)  $1.3 \times 10^{-4}$  M



- C)  $1.3 \times 10^{-5}$  M  
D)  $1.0 \times 10^{-11}$  M

Answer: <https://biology-forums.com/index.php?topic=290702>

### Question 620

Which compound is most likely to exist as a gas or liquid at room temperature?

- A)  $Al_4C_3$   
B)  $CBr_4$   
C)  $CaBr_2$   
D) WC

Answer: <https://biology-forums.com/index.php?topic=289631>

### Question 621

According to band theory, the element having all of its bonding molecular orbitals filled and all of its antibonding orbitals empty in the 4s-3d composite band is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291692>

### Question 622

What is  $W$  in Boltzmann's formula,  $S = k \ln W$ ?

- A) a fraction indicating the probability of obtaining a result  
B) a random number  
C) the number of ways of obtaining the state  
D) the work times Avogadro's number

Answer: <https://biology-forums.com/index.php?topic=290964>

### Question 623

What is the pH at the equivalence point of a weak base-strong acid titration if 20.00 mL of NaOCl requires 28.30 mL of 0.20 M HCl?  $K_a = 3.0 \times 10^{-8}$  for HOCl.

- A) 0.70  
B) 3.39  
C) 3.76  
D) 4.23

Answer: <https://biology-forums.com/index.php?topic=290913>

### Question 624

Which of the following elements will have unpaired electrons in the ground state?

- Ca, Li, C, F  
A) Ca, Li, C, and F  
B) Li, C, and F  
C) Li and F  
D) C and F

Answer: <https://biology-forums.com/index.php?topic=289408>

### Question 625

Copper has the anomalous electron configuration \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289468>

### Question 626

Which of the following transition elements (Cr, Co, Ni, and Cu) have positive oxidation potentials?

- A) Cr  
B) Cu  
C) Cr, Cu, and Ni  
D) Cr, Co, and Ni

Answer: <https://biology-forums.com/index.php?topic=291558>

### Question 627

Which element has the smallest energy band gap?

- A) C (diamond)  
B) Ge

- C) Pb
- D) Si

Answer: <https://biology-forums.com/index.php?topic=291628>

### Question 628

A heptane molecule contains 16 atoms of hydrogen. The number 16 represents how many significant figures?

- A) one
- B) two
- C) three
- D) infinite

Answer: <https://biology-forums.com/index.php?topic=288830>

### Question 629

Which of the following does not contain a carbonyl group, C=O?

- A) an alkene
- B) a ketone
- C) an amide
- D) an ester

Answer: <https://biology-forums.com/index.php?topic=292014>

### Question 630

What is not an appropriate method for the isolation of elemental boron?

- A) refluxing borax with sodium peroxide
- B) high temperature reduction of B<sub>2</sub>O<sub>3</sub> with magnesium
- C) high temperature reduction of BBr<sub>3</sub> with hydrogen over a Ta wire
- D) electrolytic reduction of aqueous B(OH)<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=291743>

### Question 631

Which compound contains a nitrogen and a C=O?

- A) ether
- B) amide
- C) carboxylic acid
- D) alkene

Answer: <https://biology-forums.com/index.php?topic=291998>

### Question 632

Elements in period 2 of the periodic table differ markedly from the heavier elements in the same group due to their especially small \_\_\_\_\_ and high \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291903>

### Question 633

Identify the statement that is true about nonelectrolytes.

- A) Nonelectrolytes dissolve in water to produce ions.
- B) Nonelectrolytes do not dissociate in water.
- C) Nonelectrolytes conduct electricity.
- D) Most nonelectrolytes are ionic compounds.

Answer: <https://biology-forums.com/index.php?topic=289215>

### Question 634

What is the structure of white phosphorus?

- A) cage system of P<sub>x</sub> molecules
- B) discrete P atoms
- C) discrete P<sub>4</sub> molecules
- D) polymeric chain-like structure

Answer: <https://biology-forums.com/index.php?topic=291793>

### Question 635

The ion, NO<sub>2</sub><sup>-</sup>, is named

- A) nitrate ion.
- B) nitrite ion.
- C) nitrogen dioxide ion.
- D) nitrogen(II) oxide ion.

Answer: <https://biology-forums.com/index.php?topic=289018>

### Question 636

How much energy is released for alpha decay of  $^{236}\text{U}$ ? The masses of  $^4\text{He}$ ,  $^{232}\text{Th}$ , and  $^{236}\text{U}$  are 4.002604, 232.038124, and 236.045637 amu, respectively.

- A)  $1.473 \times 10^8$  kJ/mol
- B)  $4.418 \times 10^8$  kJ/mol
- C)  $4.909 \times 10^8$  kJ/mol
- D)  $7.209 \times 10^8$  kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291372>

### Question 637

A buffer solution is prepared by dissolving 0.200 mol of  $\text{NaH}_2\text{PO}_4$  and 0.100 mol of  $\text{NaOH}$  in enough water to make 1.00 L of solution. What is the pH of the  $\text{H}_2\text{PO}_4^-/\text{HPO}_4^{2-}$  buffer if the  $K_{a2} = 6.2 \times 10^{-8}$ ?

- A) 6.91
- B) 7.21
- C) 7.51
- D) 7.71

Answer: <https://biology-forums.com/index.php?topic=290835>

### Question 638

The electronegativity value of C is 2.5 while the electronegativity value of F is 3.98. What is the expected electronegativity value for the C-F bond?

- A) 0
- B) 6.48
- C) 1.48
- D) -1.48

Answer: <https://biology-forums.com/index.php?topic=289630>

### Question 639

Which is the crystal field energy level diagram for a tetrahedral  $\text{ML}_4$ ?

- A) (A)
- B) (B)
- C) (C)
- D) (D)

Answer: <https://biology-forums.com/index.php?topic=291544>

### Question 640

What is the standard isotope that is used to define the number of atoms in a mole?

- A)  $^{14}\text{N}$
- B)  $^{12}\text{C}$
- C)  $^9\text{Be}$
- D)  $^{31}\text{P}$

Answer: <https://biology-forums.com/index.php?topic=288981>

### Question 641

If  $K_c$  is the equilibrium constant for a forward reaction what is  $K_c'$  for the reverse reaction?

- A)  $-K_c$
- B)  $K_c$
- C)  $(K_c)^{-1}$
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=290488>

### Question 642

The factor  $10^{-2}$  corresponds to which prefix?

- A) deka
- B) deci

- C) centi  
D) milli

Answer: <https://biology-forums.com/index.php?topic=288736>

### Question 643

A binding energy curve is a plot of binding energy per nucleon versus atomic number. In what region of the binding energy curve are the most stable elements found?

- A) in the lower left region (low atomic mass)  
B) in the central top region (moderate atomic mass)  
C) in the lower right region (heavy atomic mass)  
D) binding energy is not dependent on atomic mass

Answer: <https://biology-forums.com/index.php?topic=291367>

### Question 644

Which of the following has the greatest mass?

- A)  $6.0 \times 10^{23}$  atoms of O  
B)  $3.0 \times 10^{23}$  molecules of O<sub>2</sub>  
C)  $2.0 \times 10^{23}$  molecules of O<sub>3</sub>  
D) All have the same mass.

Answer: <https://biology-forums.com/index.php?topic=289091>

### Question 645

You are visiting the planet Lagmom. The money exchange rates are shown below. How many Lagmom fizzbarts will you receive in exchange for \$500 at the Lagmom Spaceport Currency Exchange counter?

\$1.00 = 10 razz 1 morb = 25 pobs  
5 pobs = 1 fizzbart 5 razz = 1 tanta  
1 tanta = 2 morbs

- A)  $5.00 \times 10^2$  fizzbarts  
B)  $1.00 \times 10^3$  fizzbarts  
C)  $1.00 \times 10^4$  fizzbarts  
D)  $5.00 \times 10^5$  fizzbarts

Answer: <https://biology-forums.com/index.php?topic=288773>

### Question 646

In the best Lewis structure for CO<sub>2</sub>, what is the formal charge on the C atom?

- A) -1  
B) 0  
C) +1  
D) +2

Answer: <https://biology-forums.com/index.php?topic=289619>

### Question 647

A 1.00 L flask contains nitrogen gas at 25°C and 1.00 atm pressure. What is the final pressure in the flask if an additional 0.50 g of N<sub>2</sub> gas is added to the flask and the flask cooled to -55°C?

- A) 1.01 atm  
B) 1.05 atm  
C) 0.319 atm  
D) 3.13 atm

Answer: <https://biology-forums.com/index.php?topic=289938>

### Question 648

Which of the following solutions will have the lowest freezing point?

- A) 0.0100 m NaCl  
B) 0.0120 m Li<sub>2</sub>SO<sub>4</sub>  
C) 0.0400 m CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>OH  
D) 0.0150 m MgCl<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290246>

### Question 649

Which equilibrium below is homogeneous?

- A)  $\text{CaSO}_4(\text{s}) \rightleftharpoons \text{Ca}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq})$   
B)  $2 \text{H}_2\text{O}_2(\text{l}) \rightleftharpoons 2 \text{H}_2\text{O}(\text{l}) + \text{O}_2(\text{g})$   
C)  $\text{NH}_4\text{NO}_3(\text{s}) \rightleftharpoons \text{N}_2\text{O}(\text{g}) + 2 \text{H}_2\text{O}(\text{g})$   
D)  $2 \text{CO}(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{CO}_2(\text{g})$

Answer: <https://biology-forums.com/index.php?topic=290571>

### Question 650

Which of the following have their valence electrons in the same shell?

- A) Rb, Sb, I  
B) Ga, Sn, Bi  
C) As, Sb, Bi  
D) Ar, Kr, Br

Answer: <https://biology-forums.com/index.php?topic=289440>

### Question 651

The winner of the men's 1500-meter speed skating event at a recent Winter Olympics had a time of 1:45.57. Assuming that the distance was measured accurately to five significant figures, what was the skater's average speed in miles per hour?

- A) 31.790 mi/hr  
B) 38.418 mi/hr  
C) 51.151 mi/hr  
D) 61.826 mi/hr

Answer: <https://biology-forums.com/index.php?topic=288776>

### Question 652

Calculate the pH of a 0.800 M KBrO solution.  $K_a$  for hypobromous acid, HBrO, is  $2.0 \times 10^{-9}$ .

- A) 2.70  
B) 4.40  
C) 9.60  
D) 11.30

Answer: <https://biology-forums.com/index.php?topic=290791>

### Question 653

Which metal ion is most likely to form a square planar complex ion with  $\text{CN}^-$ ?

- A)  $\text{Co}^{2+}$   
B)  $\text{Cu}^{2+}$   
C)  $\text{Ni}^{2+}$   
D)  $\text{Zn}^{2+}$

Answer: <https://biology-forums.com/index.php?topic=291517>

### Question 654

What is  $k$  in Boltzmann's formula,  $S = k \ln W$ ?

- A) the degeneracy of the state  
B) the equilibrium constant for the process  
C) the universal gas constant divided by Avogadro's number  
D) the universal gas constant times Avogadro's number

Answer: <https://biology-forums.com/index.php?topic=290967>

### Question 655

Which of the following molecules has polar bonds but has no net dipole?

- A)  $\text{NH}_3$   
B)  $\text{CCl}_4$   
C)  $\text{CHCl}_3$   
D)  $\text{CH}_4$

Answer: <https://biology-forums.com/index.php?topic=289687>

### Question 656

If the units for rate are  $\text{M s}^{-1}$ , what are the units for the rate constant,  $k$ , for a zeroth-order reaction?

- A)  $\text{s}^{-1}$   
B)  $\text{M}$   
C)  $\text{M s}^{-1}$

D)  $M^{-1} s^{-1}$

Answer: <https://biology-forums.com/index.php?topic=290431>

### Question 657

The number of grams of NaCl required to prepare 500 mL of 0.100 M NaCl is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289340>

### Question 658

Which contains Avogadro's number of formula units?

- A) 36.5 g of Cl
- B) 36.5 g of  $Cl_2$
- C) 36.5 g of HCl
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=289076>

### Question 659

Using shorthand notation, the ground-state electron configuration for  $Tl^+$  is predicted to be \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289563>

### Question 660

In a galvanic cell constructed from  $Pb(s) | Pb^{2+}(aq) || Hg^{+1} | Hg(s)$ , which of the electrodes will gain mass?

- A) the anode, Pb (s)
- B) the cathode, Pb (s)
- C) the anode, Hg (s)
- D) the cathode, Hg (s)

Answer: <https://biology-forums.com/index.php?topic=291106>

### Question 661

If 200. mL of 0.100 M  $Na_2SO_4$  is added to 200. mL of 0.150 M NaCl, what is the concentration of  $Na^+$  ions in the final solution? Assume that the volumes are additive.

- A) 0.05 M
- B) 0.175 M
- C) 0.125 M
- D) 0.250 M

Answer: <https://biology-forums.com/index.php?topic=289246>

### Question 662

The bonds in the polyatomic ion  $CO_3^{2-}$  are classified as

- A) ionic.
- B) metallic.
- C) nonpolar covalent.
- D) polar covalent.

Answer: <https://biology-forums.com/index.php?topic=289681>

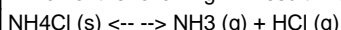
### Question 663

The number of milliliters of 12.0 M HCl required to prepare 250 mL of 0.500 M HCl is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289341>

### Question 664

Which of the following will result in an increase in the amount of  $NH_4Cl$ ?



- A) increasing the volume
- B) decreasing the amount of HCl (g)
- C) increasing the amount of  $NH_3$  (g)
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=290551>

### Question 665

The oxidation state of palladium in  $K_2[PdCl_4]$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291591>

### Question 666

What is the chemical symbol for carbon?

- A) Co
- B) Cr
- C) C
- D) Ca

Answer: <https://biology-forums.com/index.php?topic=288937>

### Question 667

What is the molecular geometry of  $\text{SbCl}_3$ ?

- A) T-shaped
- B) tetrahedral
- C) trigonal planar
- D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289722>

### Question 668

Which of the following is an example of a qualitative measurement?

- A) blue crystal
- B) 10 g of salt
- C) 2 moles of carbon atoms
- D) 12 dL of water

Answer: <https://biology-forums.com/index.php?topic=288732>

### Question 669

How many valence shell electrons does an atom of Si have?

- A) 1
- B) 6
- C) 4
- D) 2

Answer: <https://biology-forums.com/index.php?topic=289546>

### Question 670

For a particular orbital, as one goes away from the nucleus along the z-axis, the probability density decreases to zero, then increases, and finally decreases without increasing a second time. This is consistent with a

- A) 2s orbital.
- B) 4px orbital.
- C) 3f orbital.
- D) 4s orbital.

Answer: <https://biology-forums.com/index.php?topic=289426>

### Question 671

What is the entropy of 105 molecules in  $10^{10}$  boxes?

- A)  $1.59 \times 10^{-21}$
- B)  $3.45 \times 10^{-20}$
- C)  $1.38 \times 10^{-17}$
- D)  $3.18 \times 10^{-17}$

Answer: <https://biology-forums.com/index.php?topic=290965>

### Question 672

A baseball with a mass of 150 g is moving at a velocity of 40 m/s (90 mph). If the uncertainty in the velocity is 0.1 m/s, the uncertainty in position

- A) may be zero.
- B) must be less than or equal to  $4 \times 10^{-33}$  m.
- C) must be  $4 \times 10^{-33}$  m.
- D) must be greater than or equal to  $4 \times 10^{-33}$  m.

Answer: <https://biology-forums.com/index.php?topic=289380>

### Question 673

What is the molar mass of calcium permanganate?

- A) 159 g/mol
- B) 199 g/mol
- C) 216 g/mol
- D) 278 g/mol

Answer: <https://biology-forums.com/index.php?topic=289078>

### Question 674

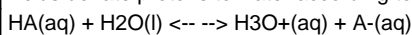
What is the molar solubility of AgCl in 0.10 M NaCN if the colorless complex ion  $\text{Ag}(\text{CN})_2^-$  forms?  $K_{sp}$  for AgCl is  $1.8 \times 10^{-10}$  and  $K_f$  for  $\text{Ag}(\text{CN})_2^-$  is  $1.0 \times 10^{21}$ .

- A) 0.050 M
- B) 0.10 M
- C) 0.20 M
- D) 0.40 M

Answer: <https://biology-forums.com/index.php?topic=290875>

### Question 675

Acids donate protons to water according to the general equation:



Consider the following acids and their equilibrium constants for reaction with water at 25°C. If all the acids have the same initial concentration, which is the strongest acid (i.e. which donates the most protons to water)?

- A) HBrO,  $K_c = 2.0 \times 10^{-9}$
- B) HNO<sub>2</sub>,  $K_c = 4.5 \times 10^{-4}$
- C) HF,  $K_c = 3.5 \times 10^{-4}$
- D) HIO<sub>3</sub>,  $K_c = 1.7 \times 10^{-1}$

Answer: <https://biology-forums.com/index.php?topic=290545>

### Question 676

Which are isotopes? An atom that has an atomic number of 35 and a mass number of 76 is an isotope of an atom that has

- A) an atomic number of 31 and a mass number of 76.
- B) an atomic number of 35 and a mass number of 80.
- C) 41 neutrons and 35 protons.
- D) 41 protons and 35 neutrons.

Answer: <https://biology-forums.com/index.php?topic=288978>

### Question 677

Which of the following elements is a good conductor of heat and electricity?

- A) carbon
- B) chlorine
- C) neon
- D) zinc

Answer: <https://biology-forums.com/index.php?topic=288953>

### Question 678

Predict the products of a reaction between  $\text{AgNO}_3(\text{aq})$  and  $\text{CsBr}(\text{aq})$ .

- A) Ag(s) and NO(g)
- B) Ag(s) and Br<sub>2</sub>(l)
- C) AgBr(s) and CsNO<sub>3</sub>(aq)
- D) AgNO<sub>3</sub>(aq) and CsBr(aq)

Answer: <https://biology-forums.com/index.php?topic=289301>

### Question 679

What is the pH of a solution prepared by mixing 25.00 mL of 0.10 M methylamine,  $\text{CH}_3\text{NH}_2$ , with 25.00 mL of 0.10 M methylammonium chloride,  $\text{CH}_3\text{NH}_3\text{Cl}$ ? Assume that the volume of the solutions are additive and that  $K_b = 3.70 \times 10^{-4}$  for methylamine.

- A) 10.27
- B) 10.57
- C) 10.87
- D) 11.78



Answer: <https://biology-forums.com/index.php?topic=290831>

### Question 680

A buffer prepared by mixing 55.0 mL of 0.40 M HF with 55.0 mL of 0.40 M NaF will have a pH that is \_\_\_\_\_ 7.0.

Answer: <https://biology-forums.com/index.php?topic=290938>

### Question 681

Which group 3A element has the largest liquid range of any known element?

- A) Al
- B) Ga
- C) In
- D) Tl

Answer: <https://biology-forums.com/index.php?topic=291738>

### Question 682

What is the least soluble salt of the following set?

- A)  $\text{Ca}(\text{OH})_2$  with  $K_{sp} = 4.7 \times 10^{-6}$
- B)  $\text{Cd}(\text{OH})_2$  with  $K_{sp} = 5.3 \times 10^{-15}$
- C)  $\text{Fe}(\text{OH})_2$  with  $K_{sp} = 4.9 \times 10^{-17}$
- D)  $\text{Cr}(\text{OH})_2$  with  $K_{sp} = 6.7 \times 10^{-31}$

Answer: <https://biology-forums.com/index.php?topic=290925>

### Question 683

What is the number of spherical nodes in a 6s orbital?

- A) zero
- B) six
- C) five
- D) seven

Answer: <https://biology-forums.com/index.php?topic=289425>

### Question 684

Element A has a valence shell configuration of  $ns2np4$  while Element B has a valence shell configuration of  $ns2np5$  where  $n$  = energy level. Which of the following statements is true regarding these elements?

- A) The ionization energy of A is lower than the ionization energy of B.
- B) The electron affinity of A is higher than the electron affinity of B.
- C) Element A and B are transition metals.
- D) Element A and B have the same I.E.

Answer: <https://biology-forums.com/index.php?topic=289492>

### Question 685

What is the  $K_a$  of the amino acid glycine if it is 75.0% dissociated at  $\text{pH} = 10.08$ ?

Answer: <https://biology-forums.com/index.php?topic=290943>

### Question 686

For a reaction that follows the general rate law,  $\text{Rate} = k[\text{A}][\text{B}]^2$ , what will happen to the rate of reaction if the concentration of A is increased by a factor of 1.50? The rate will

- A) decrease by a factor of  $1/2.25$ .
- B) decrease by a factor of  $1/1.50$ .
- C) increase by a factor of 1.50.
- D) increase by a factor of 2.25.

Answer: <https://biology-forums.com/index.php?topic=290419>

### Question 687

A sailor circumnavigated the earth and covered 4,264,000 meters. Express this number in standard scientific notation.

- A)  $4.264 \times 10^{-7}$  m
- B)  $4.264 \times 10^{-6}$  m
- C)  $4.264 \times 10^6$  m
- D)  $4.264 \times 10^7$  m

Answer: <https://biology-forums.com/index.php?topic=288737>

### Question 688

Which one of the following compounds contains a three-center, two electron (3c-2e) bond?

- A) B<sub>2</sub>H<sub>6</sub>
- B) C<sub>2</sub>H<sub>4</sub>
- C) N<sub>2</sub>H<sub>4</sub>
- D) H<sub>2</sub>O<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=291744>

### Question 689

None of the listed compounds contains a ring. Which has at least one singly-bonded carbon atom?

- A) C<sub>5</sub>H<sub>12</sub>
- B) C<sub>4</sub>H<sub>6</sub>
- C) C<sub>6</sub>H<sub>12</sub>
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=292007>

### Question 690

Which has the highest melting point?

- A) La
- B) W
- C) Os
- D) Hg

Answer: <https://biology-forums.com/index.php?topic=291536>

### Question 691

When measuring a solid metal block at constant temperature, which measurement will change in numerical value depending on the location where it is taken?

- A) length
- B) mass
- C) volume
- D) weight

Answer: <https://biology-forums.com/index.php?topic=288739>

### Question 692

Addition of 0.0125 mol HCl to 150 mL of a 0.150 M formic acid/0.100 M sodium formate buffer results in a pH = \_\_\_\_\_. The K<sub>a</sub> of formic acid is 1.8 × 10<sup>-4</sup>.

Answer: <https://biology-forums.com/index.php?topic=290942>

### Question 693

Given the hypothetical reaction: 2 A(s) + x B(g)  $\rightleftharpoons$  3 C(g), K<sub>p</sub> = 0.0105 and K<sub>c</sub> = 0.45 at 250°C. What is the value of the coefficient x?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=290519>

### Question 694

Which cell involves a nonspontaneous redox reaction?

- A) concentration cell
- B) electrolytic cell
- C) fuel cell
- D) galvanic cell

Answer: <https://biology-forums.com/index.php?topic=291090>

### Question 695

Which have the largest number of unpaired electrons in p orbitals in their ground-state electron configurations?

- A) N, As, Bi
- B) F, At, Br

C) Ne, Ar, Xe

D) B, Ga, Tl

Answer: <https://biology-forums.com/index.php?topic=289435>

### Question 696

What is the molecular geometry of  $\text{SCl}_4$ ?

A) seesaw

B) square planar

C) square pyramidal

D) tetrahedral

Answer: <https://biology-forums.com/index.php?topic=289667>

### Question 697

To make a 0.125 m solution, one could take 0.125 moles of solute and add

A) 1.00 L of solvent.

B) 1.00 kg of solvent.

C) enough solvent to make 1.00 L of solution.

D) enough solvent to make 1.00 kg of solution.

Answer: <https://biology-forums.com/index.php?topic=290286>

### Question 698

Which type of bonding does sucrose form upon solidification?

A) metallic

B) amorphous

C) molecular

D) anionic

Answer: <https://biology-forums.com/index.php?topic=290155>

### Question 699

What is the hydronium ion concentration of a 0.300 M acetic acid solution with  $K_a = 1.8 \times 10^{-5}$ ? The equation for the dissociation of acetic acid is:  
 $\text{CH}_3\text{CO}_2\text{H}(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{H}_3\text{O}^+(\text{aq}) + \text{CH}_3\text{CO}_2^-(\text{aq})$ .

A)  $2.3 \times 10^{-2}$  M

B)  $4.2 \times 10^{-2}$  M

C)  $2.3 \times 10^{-3}$  M

D)  $4.2 \times 10^{-3}$  M

Answer: <https://biology-forums.com/index.php?topic=290771>

### Question 700

Bromothymol blue indicator changes color from yellow at a pH of 6.0 to blue at a pH of 7.6. Methyl red indicator changes color from red at a pH of 4.4 to yellow at a pH of 6.2. A sample of saliva having  $[\text{H}_3\text{O}^+] = 6.310 \times 10^{-7}$  would impart a \_\_\_\_\_ color to bromothymol blue and a \_\_\_\_\_ color to methyl red.

Answer: <https://biology-forums.com/index.php?topic=290812>

### Question 701

Beta decay of  $^{60}\text{Co}$  produces a beta particle and

A)  $^{56}\text{Mn}$ .

B)  $^{59}\text{Co}$ .

C)  $^{60}\text{Fe}$ .

D)  $^{60}\text{Ni}$ .

Answer: <https://biology-forums.com/index.php?topic=291423>

### Question 702

What is least easily oxidized?

A) Al

B) Fe

C) Mg

D) Zn

Answer: <https://biology-forums.com/index.php?topic=291156>

### Question 703

Which of the following instruments directly measures the pressure of a gas?

- A) spectrometer
- B) manometer
- C) polarimeter
- D) gas chromatograph

Answer: <https://biology-forums.com/index.php?topic=289911>

### Question 704

Precipitation of an ionic compound will occur upon mixing of desired reagents if the initial ion product is

- A) greater than the  $K_{sp}$ .
- B) equal to the  $pK_{sp}$ .
- C) equal to the  $K_{sp}$ .
- D) less than the  $K_{sp}$ .

Answer: <https://biology-forums.com/index.php?topic=290879>

### Question 705

What is the binding energy (kJ/mol) for an element that has a mass defect of  $3.33 \times 10^{-26}$  g? Remember that the unit for a joule is  $\text{kg m}^{-2} \text{s}^{-2}$ .

- A)  $6.02 \times 10^3$  kJ/mole
- B)  $6.02 \times 10^{12}$  kJ/mole
- C)  $1.80 \times 10^9$  kJ/mole
- D)  $5.41 \times 10^{14}$  kJ/mole

Answer: <https://biology-forums.com/index.php?topic=291443>

### Question 706

Which definition best describes isomers that are non-superimposable mirror images of each other that rotate plane polarized light to the same degree but in opposite directions?

- A) diastereoisomers
- B) enantiomers
- C) ionization isomers
- D) racemic mixture

Answer: <https://biology-forums.com/index.php?topic=291572>

### Question 707

Hydrogen gas is collected over water in an inverted buret. If the atmospheric pressure is 745 mm Hg, the vapor pressure of water is 18 mm Hg, and a 15.0 cm-high column of water remains in the buret, the pressure of the hydrogen gas is

- A) 763 mm.
- B) 745 mm Hg.
- C) 727 mm Hg.
- D) less than 727 mm Hg.

Answer: <https://biology-forums.com/index.php?topic=289960>

### Question 708

What is the hydronium ion concentration of an acid rain sample that has a pH of 3.15?

- A)  $1.41 \times 10^{-11}$  M
- B)  $7.08 \times 10^{-4}$  M
- C) 3.15 M
- D) 10.85 M

Answer: <https://biology-forums.com/index.php?topic=290663>

### Question 709

Breaking a chemical bond requires approximately 102 kJ/mol of energy. What is closest to the order of magnitude of the energy required to split a nucleus in to its individual protons and neutrons?

- A) 103 kJ/mol
- B) 104 kJ/mol
- C) 108 kJ/mol
- D) 1010 kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291377>

### Question 710

Elements A and Q form two compounds. The ratio (mass Q)/(mass A) for compound one is 0.271 and ratio (mass Q)/(mass A) for compound two is 0.362. If compound one has the chemical formula AQ, what is the chemical formula for compound two?

- A) A3Q4
- B) A2Q3
- C) AQ2
- D) AQ3

Answer: <https://biology-forums.com/index.php?topic=288888>

### Question 711

A preliminary explanation of the results of many experiments that can be used to make predictions and suggest further experimentations is a \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=288845>

### Question 712

Which has the highest standard molar entropy at 25°C?

- A) P(s)
- B) P(l)
- C) P(g)
- D) All three should have a standard molar entropy of zero.

Answer: <https://biology-forums.com/index.php?topic=291036>

### Question 713

Which of the following is the smallest volume?

- A) 11 cm<sup>3</sup>
- B) 0.25 dL
- C) 1.4 × 10<sup>3</sup> mL
- D) 2.5 × 10<sup>7</sup> nL

Answer: <https://biology-forums.com/index.php?topic=288811>

### Question 714

Calculate the pH of a 0.20 M H<sub>2</sub>SO<sub>3</sub> solution that has the stepwise dissociation constants  $K_{a1} = 1.5 \times 10^{-2}$  and  $K_{a2} = 6.3 \times 10^{-8}$ .

- A) 1.26
- B) 1.32
- C) 1.82
- D) 2.52

Answer: <https://biology-forums.com/index.php?topic=290777>

### Question 715

When 30.0 g of zinc metal reacts with excess HCl, how many liters of H<sub>2</sub> gas are produced at STP?

- A) 0.229 L
- B) 0.458 L
- C) 5.14 L
- D) 10.3 L

Answer: <https://biology-forums.com/index.php?topic=289950>

### Question 716

Based on formal charges, the best Lewis electron-dot structure of BF<sub>3</sub> has a B—F bond order equal to \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289661>

### Question 717

A 1.40 M solution of CaCl<sub>2</sub> in water has a density of 1.11 g/mL. What is the molality?

- A) 1.90 m CaCl<sub>2</sub>
- B) 2.30 m CaCl<sub>2</sub>
- C) 1.47 m CaCl<sub>2</sub>
- D) 1.44 m CaCl<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290300>

### Question 718

At an elevated temperature the decomposition of a gaseous oxide,  $\text{AO}_2$  occurs with a rate constant,  $k = 0.54 \text{ M}^{-1}\text{s}^{-1}$ . If the half-life of this reaction is 926 seconds when  $[\text{AO}_2] = 2.0 \times 10^{-3} \text{ M}$  and 462 seconds when  $[\text{AO}_2] = 4.0 \times 10^{-3} \text{ M}$ , this reaction is \_\_\_\_\_ order.

Answer: <https://biology-forums.com/index.php?topic=290474>

### Question 719

Diamond is held together by

- A) covalent bonds.
- B) ion-dipole forces.
- C) van der Waals forces.
- D) ionic forces.

Answer: <https://biology-forums.com/index.php?topic=290165>

### Question 720

The algebraic signs (+ and -) sometimes written within the lobes of orbitals are analogous to different \_\_\_\_\_ of a wave.

Answer: <https://biology-forums.com/index.php?topic=289466>

### Question 721

The compound that does not contain oxygen is

- A) aldehyde.
- B) ester.
- C) amide.
- D) aromatic.

Answer: <https://biology-forums.com/index.php?topic=291988>

### Question 722

What are the most abundant mineral in the earth's crust?

- A) silicates
- B) iodides
- C) sulfates
- D) oxides

Answer: <https://biology-forums.com/index.php?topic=291654>

### Question 723

Dentists employ light-cured materials to fill cavities. The wavelength of electromagnetic radiation used to photopolymerize restorative materials falls in the ultraviolet or visible region, depending on the instrument employed. Which of these wavelengths is in the UV region?

- A) 31 nm
- B) 300 nm
- C) 440 nm
- D) 840 nm

Answer: <https://biology-forums.com/index.php?topic=289412>

### Question 724

In which of the following sets do all species have the same number of protons?

- A)  $\text{At}^-$ ,  $\text{Rn}$ ,  $\text{Ra}^{2+}$
- B)  $\text{C}$ ,  $\text{N}^{3-}$ ,  $\text{O}^{2-}$
- C)  $\text{CO}_3^{+}$ ,  $\text{Rh}^{3+}$ ,  $\text{Ir}^{3+}$
- D)  $\text{Br}$ ,  $\text{Co}^{2+}$ ,  $\text{Co}^{3+}$

Answer: <https://biology-forums.com/index.php?topic=288997>

### Question 725

Which is not true for standard electrode potentials?

- A) Cell constituents are in their standard states.
- B)  $E^\circ$  for oxidation is the negative of  $E^\circ$  for reduction.
- C) The half-reactions are written as reductions.
- D) The potential for the standard hydrogen electrode is chosen to be +1.00 V.

Answer: <https://biology-forums.com/index.php?topic=291115>

### Question 726

A zeroth order reaction is one whose

- A) rate is zero.
- B) rate is independent of reactant concentration.
- C) rate can be found where  $[A]_t = -kt + \ln [A]_0$ .
- D) rate is dependent on none of the reactants.

Answer: <https://biology-forums.com/index.php?topic=290369>

### Question 727

At 25°C the vapor pressures of benzene and toluene are 96.0 mm Hg and 30.5 mm Hg, respectively. When a 1:1 molar mixture of benzene and toluene is fractionally distilled, the first fraction will have a mole fraction of benzene that is \_\_\_\_\_ (equal to, greater than, less than) 0.50.

Answer: <https://biology-forums.com/index.php?topic=290349>

### Question 728

Which of the following underlined items is not an intensive property?

- A) the amount of gold.
- B) the color of copper hydroxide
- C) the density of argon
- D) the melting point of iron metal

Answer: <https://biology-forums.com/index.php?topic=288956>

### Question 729

A carbon dioxide monitoring product provides a reading of 202 ppm. Calculate the percent carbon dioxide by volume.

- A) 2.02
- B) 0.0202
- C) 0.202
- D) 20.2

Answer: <https://biology-forums.com/index.php?topic=290044>

### Question 730

What statement is inconsistent about carbon monoxide?

- A) It is a colorless, odorless and toxic gas.
- B) It is formed by burning carbon or hydrocarbon in excess oxygen.
- C) One of its main industrial uses is in the synthesis of methanol, CH<sub>3</sub>OH.
- D) Toxicity of CO results from its ability to bond strongly to iron(II) atom in hemoglobin.

Answer: <https://biology-forums.com/index.php?topic=291770>

### Question 731

Which of the following have the same number of valence electrons?

- A) Cs, Bi, At
- B) In, Pb, Bi
- C) N, P, As
- D) Xe, Rn, At

Answer: <https://biology-forums.com/index.php?topic=289441>

### Question 732

The thiosulfate ion is

- A) HS<sup>-</sup>.
- B) HSO<sub>4</sub><sup>2-</sup>.
- C) SO<sub>5</sub><sup>2-</sup>.
- D) S<sub>2</sub>O<sub>3</sub><sup>2-</sup>.

Answer: <https://biology-forums.com/index.php?topic=288926>

### Question 733

How would one synthesize a perchlorate salt?

- A) Electrolytic oxidation of a solution of chlorate salt.
- B) Electrolytic oxidation of a solution of chlorite salt.
- C) Electrolytic oxidation of a solution of hypochlorite salt.

D) Oxidation of a solution of chlorate salt by a perbromate salt.

Answer: <https://biology-forums.com/index.php?topic=291837>

### Question 734

The magnitude of the heats of vaporization, fusion and sublimation of a substance reflect the

- A) density of the substance.
- B) magnitudes of the boiling and melting points of the substance.
- C) strength of the covalent bonds between atoms in each molecule of the substance.
- D) strength of the intermolecular forces of the substance.

Answer: <https://biology-forums.com/index.php?topic=290076>

### Question 735

The definitive distinction between ionic bonding and covalent bonding is that

- A) ionic bonding involves a sharing of electrons and covalent bonding involves a transfer of electrons.
- B) ionic bonding involves a transfer of electrons and covalent bonding involves a sharing of electrons.
- C) ionic bonding requires two nonmetals and covalent bonding requires a metal and a nonmetal.
- D) covalent bonding requires two nonmetals and ionic bonding requires a metal and a nonmetal.

Answer: <https://biology-forums.com/index.php?topic=288920>

### Question 736

What molality of pentane is obtained by dissolving 25 g pentane, C<sub>5</sub>H<sub>12</sub>, in 245.0 g hexane, C<sub>6</sub>H<sub>14</sub>?

- A) 0.093 m
- B) 0.11 m
- C) 1.4 m
- D) 100 m

Answer: <https://biology-forums.com/index.php?topic=290287>

### Question 737

What is the pH of the resulting solution if 25 mL of 0.432 M methylamine, CH<sub>3</sub>NH<sub>2</sub>, is added to 15 mL of 0.234 M HCl? Assume that the volumes of the solutions are additive.  $K_a = 2.70 \times 10^{-11}$  for CH<sub>3</sub>NH<sub>3</sub><sup>+</sup>.

- A) 3.11
- B) 3.74
- C) 10.26
- D) 10.89

Answer: <https://biology-forums.com/index.php?topic=290863>

### Question 738

For Cu<sup>2+</sup> and CO<sub>2</sub>, which will behave as a Lewis acid toward OH<sup>-</sup> in water?

- A) only Cu<sup>2+</sup>
- B) only CO<sub>2</sub>
- C) Cu<sup>2+</sup> and CO<sub>2</sub>
- D) neither Cu<sup>2+</sup> nor CO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290722>

### Question 739

The chemical formula for nitric acid is

- A) HNO<sub>2</sub>(aq).
- B) HNO<sub>3</sub>(aq).
- C) H<sub>2</sub>NO<sub>3</sub>(aq).
- D) H<sub>2</sub>NO<sub>2</sub>(aq).

Answer: <https://biology-forums.com/index.php?topic=289240>

### Question 740

For a galvanic cell, the cathode has a \_\_\_\_\_ sign and is the site of \_\_\_\_\_.

- A) negative, oxidation
- B) negative, reduction
- C) positive, oxidation
- D) positive, reduction

Answer: <https://biology-forums.com/index.php?topic=291092>



### Question 741

What is the molarity of chloride ions when 10.4 grams of  $MgCl_2$  is dissolved in 753 mL of water?

- A) 0.00 M
- B) 0.145 M
- C) 0.000290 M
- D) 0.290 M3

Answer: <https://biology-forums.com/index.php?topic=289293>

### Question 742

What is the relationship between  $K_a$  and  $K_b$  at  $25^\circ C$  for a conjugate acid base pair?

- A)  $K_a \times K_b = 1 \times 10^{-14}$
- B)  $K_a/K_b = 1 \times 10^{-14}$
- C)  $K_b/K_a = 1 \times 10^{-14}$
- D)  $K_a - K_b = 1 \times 10^{-14}$

Answer: <https://biology-forums.com/index.php?topic=290785>

### Question 743

Because of the high heat and low humidity in the summer in Death Valley, California, a visitor requires about one quart of water for every two miles traveled on foot. Calculate the approximate number of liters required for a person to walk 15 kilometers in Death Valley.

- A) 4.4 L
- B) 18 L
- C) 46 L
- D) 70 L

Answer: <https://biology-forums.com/index.php?topic=288839>

### Question 744

Which of the following gases has the lowest average speed at  $25^\circ C$ ?

- A) He
- B)  $BF_3$
- C)  $H_2$
- D)  $NH_3$

Answer: <https://biology-forums.com/index.php?topic=290033>

### Question 745

Which of the following statements is false concerning the formula of a compound?

- A) The empirical formula is the simplest whole numbered ratio of atoms in a compound.
- B) The molecular formula is the true ratio of atoms in a compound.
- C) The molecular formula and empirical formula can be identical.
- D) The number of atoms in a molecular formula is always greater than the number of atoms in an empirical formula.

Answer: <https://biology-forums.com/index.php?topic=289111>

### Question 746

Which of the following elements is classified as a semimetal?

- A) gold
- B) astatine
- C) osmium
- D) berkelium

Answer: <https://biology-forums.com/index.php?topic=288961>

### Question 747

One mole of gas at  $25^\circ C$  in a 3.0-L flask has a \_\_\_\_\_ pressure than one mole of gas at  $25^\circ C$  in a 14.0-L flask.

Answer: <https://biology-forums.com/index.php?topic=290051>

### Question 748

In a nuclear reaction He is the symbol for \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291458>

### Question 749

A silicon carbide ceramic has a unit cell with carbon atoms in a cubic closest packed arrangement with carbon atoms occupying one-half of the tetrahedral holes. The empirical formula of this ceramic is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291704>

### Question 750

AgCl is found to have 78.1% ionic character, and its gas phase dipole moment is 11.5 D. What is the distance between the Ag and Cl atoms in gaseous AgCl?

- A)  $9.19 \times 10^{-10}$  pm
- B) 14.7 pm
- C) 307 pm
- D) 903 pm

Answer: <https://biology-forums.com/index.php?topic=289684>

### Question 751

What is the pressure in a gas container that is connected to an open-end U-tube manometer if the pressure of the atmosphere is 722 torr and the level of mercury in the arm connected to the container is 8.60 cm higher than the level of mercury open to the atmosphere?

- A) 636 mm Hg
- B) 713 mm Hg
- C) 731 mm Hg
- D) 808 mm Hg

Answer: <https://biology-forums.com/index.php?topic=289987>

### Question 752

Which is the strongest oxidizing agent under acidic conditions?

- A)  $\text{Cr}^{2+}$
- B)  $\text{Cr}^{3+}$
- C)  $\text{CrO}_4^{2-}$
- D)  $\text{Cr}_2\text{O}_7^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291499>

### Question 753

The ground-state electron configuration of the  $\text{C}^{4-}$ , is the same as which noble gas?

Answer: <https://biology-forums.com/index.php?topic=289470>

### Question 754

Of the following, which element has the highest first ionization energy?

- A) P
- B) C
- C) Si
- D) N

Answer: <https://biology-forums.com/index.php?topic=289487>

### Question 755

Which one of the following is not a main group element?

- A) Rb
- B) Ba
- C) Fe
- D) Ge

Answer: <https://biology-forums.com/index.php?topic=291847>

### Question 756

A proton is approximately

- A) 600 times larger than an electron.
- B) 2000 times larger than an electron.
- C) 700 times smaller than an electron.
- D) 3000 times smaller than an electron.

Answer: <https://biology-forums.com/index.php?topic=288971>

### Question 757

What is the pH of the resulting solution if 40. mL of 0.432 M methylamine,  $\text{CH}_3\text{NH}_2$ , is added to 15 mL of 0.234 M HCl? Assume that the volumes of the solutions are additive.  $K_a = 2.70 \times 10^{-11}$  for  $\text{CH}_3\text{NH}_3^+$ .

- A) 2.84
- B) 4.02
- C) 9.97
- D) 11.16

Answer: <https://biology-forums.com/index.php?topic=290914>

### Question 758

Which oxide ore will yield the greatest number of grams of pure metal per kilogram of ore?

- A) cassiterite,  $\text{SnO}_2$
- B) hematite,  $\text{Fe}_2\text{O}_3$
- C) pyrolusite,  $\text{MnO}_2$
- D) rutile,  $\text{TiO}_2$

Answer: <https://biology-forums.com/index.php?topic=291598>

### Question 759

A solution is prepared by dissolving 17.75 g sulfuric acid,  $\text{H}_2\text{SO}_4$ , in enough water to make 100.0 mL of solution. If the density of the solution is 1.1094 g/mL, what is the molality?

- A) 0.1775 m  $\text{H}_2\text{SO}_4$
- B) 0.1810 m  $\text{H}_2\text{SO}_4$
- C) 1.810 m  $\text{H}_2\text{SO}_4$
- D) 1.940 m  $\text{H}_2\text{SO}_4$

Answer: <https://biology-forums.com/index.php?topic=290209>

### Question 760

Which elements of group 3A are commonly used in semiconductors?

- A) Tl and Al
- B) Tl and Ga
- C) Ga and In
- D) In and Tl

Answer: <https://biology-forums.com/index.php?topic=291872>

### Question 761

A solution with a hydrogen ion concentration of  $3.25 \times 10^{-5}$  M is \_\_\_\_\_ and has a hydroxide ion concentration of \_\_\_\_\_.

- A) acidic,  $3.08 \times 10^{-9}$  M
- B) acidic,  $3.08 \times 10^{-10}$  M
- C) basic,  $3.08 \times 10^{-9}$  M
- D) basic,  $3.08 \times 10^{-10}$  M

Answer: <https://biology-forums.com/index.php?topic=290751>

### Question 762

Which of the following forms a molecular solid?

- A) lithium chloride
- B) water
- C) graphite
- D) gold

Answer: <https://biology-forums.com/index.php?topic=290151>

### Question 763

For the reaction:  $4 \text{HCl}(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{Cl}_2(\text{g}) + 2 \text{H}_2\text{O}(\text{l})$ , the equilibrium constant is 0.063 at 400 K. If the reaction quotient is 0.100, which of the following statements is not correct?

- A)  $[\text{HCl}]$  will increase.
- B)  $[\text{O}_2]$  will increase.
- C)  $[\text{H}_2\text{O}]$  will decrease.
- D)  $[\text{O}_2]$  will decrease.

Answer: <https://biology-forums.com/index.php?topic=290587>

### Question 764

Which one of the following is not used to describe the condition of a gas?

- A) number of moles
- B) electronic configuration
- C) temperature
- D) pressure

Answer: <https://biology-forums.com/index.php?topic=289997>

### Question 765

Which one of the following amino acids contains a polar side chain?

- A) valine
- B) glycine
- C) cysteine
- D) alanine

Answer: <https://biology-forums.com/index.php?topic=292021>

### Question 766

The bonds in the polyatomic ion  $\text{NO}_3^-$  are classified as \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289763>

### Question 767

Which one of the following is an n-type of semiconductor?

- A) alumina
- B) germanium doped with antimony
- C) germanium doped with boron
- D) tellurium

Answer: <https://biology-forums.com/index.php?topic=291632>

### Question 768

What is the pH of a solution made by mixing 100.00 mL of 0.20 M HCl with 50.00 mL of 0.10 M HCl? Assume that the volumes are additive.

- A) 0.15
- B) 0.52
- C) 0.78
- D) 1.70

Answer: <https://biology-forums.com/index.php?topic=290677>

### Question 769

What is not a correct expression for the weak acid HA?

- A)  $K_a = \frac{[\text{H}_3\text{O}^+][\text{A}^-]}{[\text{HA}]}$
- B)  $\text{p}K_a = \text{pH} - \log\left\{\frac{[\text{A}^-]}{[\text{HA}]}\right\}$
- C)  $\text{p}K_a = \log K_a$
- D)  $\text{p}K_a = 14 - \text{p}K_b$

Answer: <https://biology-forums.com/index.php?topic=290845>

### Question 770

The compound  $\text{K}_2\text{CO}_3$  is predicted to be soluble based on the solubility guideline that all \_\_\_\_\_ are soluble.

Answer: <https://biology-forums.com/index.php?topic=289346>

### Question 771

Chromium can be electroplated from an aqueous solution containing sulfuric acid and chromic acid,  $\text{H}_2\text{CrO}_4$ . What current is required to deposit chromium at a rate of 1.25 g/min?

- A) 38.1 A
- B) 38.7 A
- C) 116 A
- D) 232 A

Answer: <https://biology-forums.com/index.php?topic=291173>

### Question 772

How many resonance structures are required in the electron-dot structure of  $\text{CO}_3^{2-}$ ?

- A) two
- B) three

- C) four
- D) five

Answer: <https://biology-forums.com/index.php?topic=289616>

### Question 773

Which one of the following compounds contains ionic bonds?

- A) MgO
- B) HCl
- C)  $\text{PCl}_3$
- D)  $\text{CO}_2$

Answer: <https://biology-forums.com/index.php?topic=289004>

### Question 774

"Glycerol" is the common name for

- A) ethanol.
- B) 2-propanol.
- C) 1, 2-ethanediol.
- D) 1, 2, 3-propanetriol.

Answer: <https://biology-forums.com/index.php?topic=291963>

### Question 775

What volume of  $5.00 \times 10^{-3} \text{ M HNO}_3$  is needed to titrate 100.00 mL of  $5.00 \times 10^{-3} \text{ M Ca(OH)}_2$  to the equivalence point?

- A) 12.5 mL
- B) 50.0 mL
- C) 100. mL
- D) 200. mL

Answer: <https://biology-forums.com/index.php?topic=290852>

### Question 776

The group 4A element that always obeys the octet rule in its stable compounds is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289579>

### Question 777

The number of electrons in the ion  $\text{Zn}^{2+}$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289569>

### Question 778

Hydrogenation of vegetable oils converts them into what type of molecule?

- A) esters
- B) ethers
- C) polymers
- D) saturated fats

Answer: <https://biology-forums.com/index.php?topic=291962>

### Question 779

What bond distance is expected to be longest?

- A) A carbon-carbon bond with a bond order of 0
- B) A carbon-carbon bond with a bond order of 1
- C) A carbon-carbon bond with a bond order of 2
- D) A carbon-carbon bond with a bond order of 3

Answer: <https://biology-forums.com/index.php?topic=289589>

### Question 780

When 1.0 gram of hydrogen reacts with 8.0 grams of oxygen 9.0 grams of water are produced and 142 kJ of heat are released. How many grams of hydrogen and how many grams of oxygen must react to produce 250 kJ of heat?

- A) 0.57 g  $\text{H}_2$  and 4.5 g  $\text{O}_2$
- B) 0.57 g  $\text{H}_2$  and 14 g  $\text{O}_2$
- C) 1.8 g  $\text{H}_2$  and 4.5 g  $\text{O}_2$
- D) 1.8 g  $\text{H}_2$  and 14 g  $\text{O}_2$

Answer: <https://biology-forums.com/index.php?topic=288780>

### Question 781

Which of the following compounds forms a covalent network solid?

- A) Na
- B) diamond
- C) N<sub>2</sub>
- D) CS<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290153>

### Question 782

Calculate the solubility (in g/L) of silver carbonate in water at 25°C if the K<sub>sp</sub> for Ag<sub>2</sub>CO<sub>3</sub> is  $8.4 \times 10^{-12}$ .

- A)  $8.0 \times 10^{-4}$  g/L
- B)  $3.5 \times 10^{-2}$  g/L
- C)  $4.4 \times 10^{-2}$  g/L
- D)  $5.6 \times 10^{-2}$  g/L

Answer: <https://biology-forums.com/index.php?topic=290870>

### Question 783

A balloon filled with helium gas at 20°C occupies 2.91 L at 1.00 atm. The balloon is immersed in liquid nitrogen at -180°C, raising the pressure to 5.20 atm. What is the volume of the balloon in the liquid nitrogen?

- A) 0.178 L
- B) 5.62 L
- C) 5.04 L
- D) 0.199 L

Answer: <https://biology-forums.com/index.php?topic=289930>

### Question 784

How many d electrons are there in Cr O<sub>4</sub><sup>2-</sup>?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=291546>

### Question 785

For a homogeneous equilibrium of gases, which of the following changes in reaction conditions will not alter the equilibrium concentrations?

- A) addition of an inert gas to the reaction mixture
- B) addition of products
- C) increasing the volume
- D) increasing the temperature

Answer: <https://biology-forums.com/index.php?topic=290590>

### Question 786

Which is expected to have the largest dispersion forces?

- A) C<sub>2</sub>H<sub>4</sub>
- B) C<sub>8</sub>H<sub>16</sub>
- C) Cl<sub>2</sub>
- D) N<sub>2</sub>H<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289748>

### Question 787

Write a balanced chemical equation for obtaining iron metal by the reduction of hematite, Fe<sub>2</sub>O<sub>3</sub>, by hydrogen gas.

Answer: <https://biology-forums.com/index.php?topic=291688>

### Question 788

The solids formed by Na, Na<sub>2</sub>O<sub>2</sub>, SiO<sub>2</sub>, and N<sub>2</sub> are classified as \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=290172>

### Question 789

What is the pH of a solution made by mixing 30.00 mL of 0.10 M acetic acid with 40.00 mL of 0.10 M KOH? Assume that the volumes of the solutions are additive.  $K_a = 1.8 \times 10^{-5}$  for  $\text{CH}_3\text{CO}_2\text{H}$ .

- A) 8.26
- B) 9.26
- C) 11.13
- D) 12.15

Answer: <https://biology-forums.com/index.php?topic=290859>

### Question 790

What statement is most consistent for an acid with a pH = 1?

- A) one one-hundredth as strong as an acid with a pH of 3
- B) half as strong as an acid with a pH = 3
- C) twice as strong as an acid with a pH of 3
- D) one hundred times as strong as an acid with a pH = 3

Answer: <https://biology-forums.com/index.php?topic=290760>

### Question 791

What factor affects the rate of a chemical reaction?

- A) collision frequency
- B) fraction of collisions with sufficient energy
- C) orientation of molecules
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=290389>

### Question 792

How many grams of KBr are required to make 850. mL of a 0.115 M KBr solution?

- A) 0.0978 g
- B) 85.9 g
- C) 11.6 g
- D) 13.7 g

Answer: <https://biology-forums.com/index.php?topic=290222>

### Question 793

The normal boiling point for H Br is higher than the normal boiling point for H Cl. This can be explained by

- A) larger dipole-dipole forces for H Br.
- B) larger dispersion forces for H Br.
- C) larger hydrogen-bond forces for H Br.
- D) larger dipole-dipole forces, larger dispersion forces, and larger hydrogen-bond forces for H Br.

Answer: <https://biology-forums.com/index.php?topic=289755>

### Question 794

Combustion analysis of an unknown compound containing only carbon and hydrogen produced 2.845 g of  $\text{CO}_2$  and 1.744 g of  $\text{H}_2\text{O}$ . What is the empirical formula of the compound?

- A)  $\text{CH}_2$
- B)  $\text{CH}_3$
- C)  $\text{C}_4\text{H}_{10}$
- D)  $\text{C}_5\text{H}_2$

Answer: <https://biology-forums.com/index.php?topic=289116>

### Question 795

What type of bonding is found in the compound  $\text{PCl}_5$ ?

- A) covalent bonding
- B) hydrogen bonding
- C) ionic bonding
- D) metallic bonding

Answer: <https://biology-forums.com/index.php?topic=288915>

### Question 796

Which cation in each set would be expected to have the larger (more negative) hydration energy?

- I. Cu<sup>+</sup> or Cu<sup>2+</sup>
  - II. Li<sup>+</sup> or NH<sub>4</sub><sup>+</sup>
- A) Cu<sup>+</sup> in set I and Li<sup>+</sup> in set II  
B) Cu<sup>+</sup> in set I and NH<sub>4</sub><sup>+</sup> in set II  
C) Cu<sup>2+</sup> in set I and Li<sup>+</sup> in set II  
D) Cu<sup>2+</sup> in set I and NH<sub>4</sub><sup>+</sup> in set II

Answer: <https://biology-forums.com/index.php?topic=290273>

### Question 797

Which of the following ionic compounds would be expected to have the highest lattice energy?

- A) MgS  
B) KBr  
C) K<sub>2</sub>S  
D) BeBr<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289557>

### Question 798

Which statement about the equilibrium constant is true? The value of K<sub>c</sub>

- A) changes as product concentration changes.  
B) changes as reactant concentration changes.  
C) changes as temperature changes.  
D) changes under the conditions described in A-C.

Answer: <https://biology-forums.com/index.php?topic=290495>

### Question 799

Which contains both covalent bonds and ionic bonds?

- A) HBr  
B) LiI  
C) NH<sub>3</sub>  
D) NH<sub>4</sub>Cl

Answer: <https://biology-forums.com/index.php?topic=289524>

### Question 800

Of the following, which element has the highest first ionization energy?

- A) barium  
B) cesium  
C) indium  
D) rubidium

Answer: <https://biology-forums.com/index.php?topic=289532>

### Question 801

Which one of the following objects is chiral?

- A) a bottle  
B) a chair  
C) a blank paper  
D) a shoe

Answer: <https://biology-forums.com/index.php?topic=291573>

### Question 802

The freezing point of methane is -295°F and the boiling point is -263°F. The temperature of the surface of Titan, a moon of Saturn, is 93 K. If methane exists on Titan, it is

- A) a gas.  
B) a liquid.  
C) a solid.  
D) a plasma.

Answer: <https://biology-forums.com/index.php?topic=288750>



### Question 803

The compound, NO<sub>2</sub>, is named

- A) nitrate.
- B) nitrite.
- C) nitrogen dioxide.
- D) nitrogen(IV) oxide.

Answer: <https://biology-forums.com/index.php?topic=288924>

### Question 804

The Br—Cl bond has 5.05% ionic character and a dipole moment of 0.518 D. What is the distance between atoms in BrCl?

Answer: <https://biology-forums.com/index.php?topic=289766>

### Question 805

When 200. mL of  $1.50 \times 10^{-4}$  M hydrochloric acid is added to 100. mL of  $1.75 \times 10^{-4}$  M Mg(OH)<sub>2</sub>, the resulting solution will be

- A) acidic.
- B) basic.
- C) neutral.
- D) It is impossible to tell from the information given.

Answer: <https://biology-forums.com/index.php?topic=289268>

### Question 806

What is the hydronium ion concentration of an acid rain sample that has a pH of 3.25?

- A)  $1.78 \times 10^{-11}$  M
- B)  $5.62 \times 10^{-4}$  M
- C) 3.25 M
- D) 10.75 M

Answer: <https://biology-forums.com/index.php?topic=290758>

### Question 807

Given the reaction:  $2 \text{HI} \rightleftharpoons \text{H}_2 + \text{I}_2$ . If K<sub>c</sub>' for the reverse reaction is  $1.85 \times 10^{-2}$  at 425°C, what is K<sub>c</sub> for the forward reaction at the same temperature?

- A)  $-1.85 \times 10^{-2}$
- B)  $1.85 \times 10^{-2}$
- C)  $3.70 \times 10^{-2}$
- D) 54.1

Answer: <https://biology-forums.com/index.php?topic=290492>

### Question 808

If the age of the Earth is 4.5 billion years and the half-life of <sup>40</sup>K is 1.26 billion years, what percent of the Earth's original amount of <sup>40</sup>K remains today?

- A) 4.2%
- B) 8.4%
- C) 12%
- D) 16%

Answer: <https://biology-forums.com/index.php?topic=291416>

### Question 809

The balanced net ionic equation for the neutralization reaction involving equal molar amounts of HI and KOH is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290933>

### Question 810

Compared to the terminal B—H bonds the bridging H—B bonds in B<sub>2</sub>H<sub>6</sub> are

- A) longer and stronger.
- B) longer and weaker.
- C) shorter and stronger.
- D) shorter and weaker.

Answer: <https://biology-forums.com/index.php?topic=291746>

### Question 811

Cr<sup>3+</sup> has \_\_\_\_\_ valence electrons.

Answer: <https://biology-forums.com/index.php?topic=291583>

### Question 812

The number of electrons in the ion C<sup>4-</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289061>

### Question 813

A 0.529-g sample of gas occupies 125 mL at 60. cm of Hg and 25°C. What is the molar mass of the gas?

- A) 11 g/mol
- B) 81 g/mol
- C) 110 g/mol
- D) 130 g/mol

Answer: <https://biology-forums.com/index.php?topic=290012>

### Question 814

A gas occupies 22.4 L at STP and 9.85 L at 100.°C and 2.00 atm pressure. How many moles of gas did the system gain or lose?

- A) 1.36 moles gained
- B) 1.64 moles gained
- C) 0.644 moles lost
- D) 0.356 moles lost

Answer: <https://biology-forums.com/index.php?topic=289940>

### Question 815

Which alkaline earth metal reacts the most vigorously with water at room temperature?

- A) Rb
- B) Mg
- C) Ba
- D) Lr

Answer: <https://biology-forums.com/index.php?topic=291869>

### Question 816

Which of the following pairs have the most similar chemical properties?

- A) alkynes and esters
- B) alkenes and aromatics
- C) amines and carboxylic acids
- D) ketones and aldehydes

Answer: <https://biology-forums.com/index.php?topic=291993>

### Question 817

How many valence shell electrons does an atom of aluminum have?

- A) 1
- B) 2
- C) 3
- D) 13

Answer: <https://biology-forums.com/index.php?topic=289545>

### Question 818

The solubility of a gas in a liquid is greatest at \_\_\_\_\_ pressures and \_\_\_\_\_ temperatures.

Answer: <https://biology-forums.com/index.php?topic=290333>

### Question 819

What is the chemical formula for the superoxide ion?

- A) O-
- B) O<sup>2-</sup>
- C) O<sub>2</sub><sup>-</sup>
- D) O<sub>2</sub><sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=291809>

### Question 820

Which of the following is not true?

- A) A spontaneous reaction need not occur immediately.
- B) A spontaneous reaction must be exothermic and must have an increase in entropy.
- C) The reverse of a nonspontaneous reaction is always spontaneous.
- D) A spontaneous reaction is one that can proceed on its own.

Answer: <https://biology-forums.com/index.php?topic=289829>

### Question 821

An aqueous solution has a normal boiling point of 102.5°C. What is the freezing point of this solution? For water  $K_b = 0.51^\circ\text{C}/\text{m}$  and  $K_f = 1.86^\circ\text{C}/\text{m}$ .

- A)  $-0.69^\circ\text{C}$
- B)  $-2.5^\circ\text{C}$
- C)  $-3.6^\circ\text{C}$
- D)  $-9.1^\circ\text{C}$

Answer: <https://biology-forums.com/index.php?topic=290315>

### Question 822

An archeological artifact was subjected to radiocarbon dating. The artifact showed a carbon-14 decay rate of 13.8 disintegrations/min per gram of carbon. Carbon-14 has a half-life of 5715 years, and currently living organisms decay at the rate of 15.3 disintegrations/min per gram of carbon. What is the approximate age of the artifact?

- A) 257 years old
- B) 371 years old
- C) 591 years old
- D) 851 years old

Answer: <https://biology-forums.com/index.php?topic=291412>

### Question 823

The human body is thought to contain \_\_\_\_\_ different kinds of proteins.

- A) 90,000
- B) 150,000
- C) 200,000
- D) 110,000

Answer: <https://biology-forums.com/index.php?topic=292028>

### Question 824

The chemical formula for iodic acid is

- A)  $\text{HIO}(\text{aq})$ .
- B)  $\text{HIO}_2(\text{aq})$ .
- C)  $\text{HIO}_3(\text{aq})$ .
- D)  $\text{HIO}_4(\text{aq})$ .

Answer: <https://biology-forums.com/index.php?topic=289312>

### Question 825

Which one of the following salts, when dissolved in water, produces the solution with a pH closest to 7.00?

- A)  $\text{NH}_4\text{I}$
- B)  $\text{Na}_2\text{O}$
- C)  $\text{KHCO}_3$
- D)  $\text{CsCl}$

Answer: <https://biology-forums.com/index.php?topic=290789>

### Question 826

The sugar in RNA is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292068>

### Question 827

When equal molar amounts of the following sets of compounds are mixed in water, which will not form a buffer solution?

- A)  $\text{KH}_2\text{PO}_4$  with  $\text{K}_2\text{HPO}_4$

- B) NH<sub>3</sub> with NH<sub>4</sub>I
- C) CH<sub>3</sub>CO<sub>2</sub>H with LiCH<sub>3</sub>CO<sub>2</sub>
- D) HNO<sub>3</sub> with LiNO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290902>

### Question 828

Which of the following statements about a catalyst is true?

- A) A catalyst decreases the position of the equilibrium in a reaction.
- B) A catalyst increases the pressure of a reaction.
- C) A catalyst is consumed in a chemical reaction.
- D) A catalyst provides a lower energy pathway for a reaction.

Answer: <https://biology-forums.com/index.php?topic=290601>

### Question 829

Which is not true?

- A) Mendeleev ended each row in his periodic table with an inert gas.
- B) Mendeleev left gaps in his periodic table for undiscovered elements.
- C) Mendeleev ordered the elements in his periodic table by atomic weight.
- D) Mendeleev's periodic table predated the concept of electron configuration.

Answer: <https://biology-forums.com/index.php?topic=288865>

### Question 830

To which family does this organic compound belong?

- A) alcohol
- B) aldehyde
- C) ether
- D) ketone

Answer: <https://biology-forums.com/index.php?topic=291985>

### Question 831

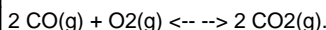
Which of the following forms a molecular solid?

- A) CaCl<sub>2</sub>
- B) C<sub>9</sub>H<sub>8</sub>O<sub>4</sub>
- C) C, graphite
- D) palladium

Answer: <https://biology-forums.com/index.php?topic=290146>

### Question 832

An equilibrium mixture of CO, O<sub>2</sub> and CO<sub>2</sub> at a certain temperature contains 0.0010 M CO<sub>2</sub> and 0.0020 M O<sub>2</sub>. At this temperature, K<sub>c</sub> equals 1.4 × 10<sup>2</sup> for the reaction:



What is the equilibrium concentration of CO?

- A) 3.6 × 10<sup>-6</sup> M
- B) 1.9 × 10<sup>-3</sup> M
- C) 7.0 × 10<sup>-2</sup> M
- D) 2.6 × 10<sup>-1</sup> M

Answer: <https://biology-forums.com/index.php?topic=290578>

### Question 833

An element M reacts with chlorine to form MCl<sub>2</sub>, with oxygen to form MO, and with nitrogen to form M<sub>3</sub>N<sub>2</sub>. The most likely candidate for the element is

- A) Na
- B) Sr
- C) B
- D) Ge

Answer: <https://biology-forums.com/index.php?topic=289550>

### Question 834

Chemistry is the study of the composition, properties, and transformations of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=288844>

### Question 835

When 110 mL of 0.12 M NaF is added to 110 mL of 0.12 M HF, relative to the pH of the 0.10 M HF solution the pH of the resulting solution will

- A) become 7.
- B) decrease.
- C) increase.
- D) remain the same.

Answer: <https://biology-forums.com/index.php?topic=290899>

### Question 836

What are the major solute-solvent interactions created when HOCH<sub>2</sub>CH<sub>2</sub>OH dissolves in water?

- A) dipole-dipole
- B) dispersion
- C) hydrogen bonding
- D) ion-dipole

Answer: <https://biology-forums.com/index.php?topic=290276>

### Question 837

Which one of the following salts, when dissolved in water, produces the solution with the highest pH?

- A) KHSO<sub>4</sub>
- B) RbClO<sub>4</sub>
- C) BaO
- D) CH<sub>3</sub>CH<sub>3</sub>NH<sub>3</sub>Br

Answer: <https://biology-forums.com/index.php?topic=290786>

### Question 838

Which of the following is not a strong acid?

- A) HF
- B) HCl
- C) HBr
- D) HI

Answer: <https://biology-forums.com/index.php?topic=289233>

### Question 839

Using shorthand notation, the ground-state electron configuration of the chromium ion in CrCl<sub>2</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289565>

### Question 840

What is the chemical formula for strontium hydroxide?

- A) SrH<sub>2</sub>
- B) SrOH
- C) SrOH<sub>2</sub>
- D) Sr(OH)<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289011>

### Question 841

What is the temperature of SO<sub>2</sub> gas if the average speed (actually the root-mean-square speed) of the molecules is 750 m/s?

- A) 1.92 K
- B) 1.44 × 10<sup>3</sup> K
- C) 1.92 × 10<sup>3</sup> K
- D) 1.44 × 10<sup>6</sup> K

Answer: <https://biology-forums.com/index.php?topic=290034>

### Question 842

Among the main-group elements the number of semimetals is

- A) five.
- B) six.
- C) seven.
- D) eight.

Answer: <https://biology-forums.com/index.php?topic=291711>

### Question 843

Which one of the following statements about isotopes is false?

- A) The ratio of neutrons to protons is about 1:1 for elements lighter than Ca.
- B) The ratio of neutrons to protons is  $> 1:1$  for elements heavier than Ca.
- C) Nonradioactive isotopes generally have an odd number of neutrons.
- D) All isotopes beyond 209Bi are radioactive.

Answer: <https://biology-forums.com/index.php?topic=291346>

### Question 844

Which of the following contains an atom that does not obey the octet rule?

- A) LiBr
- B) CO<sub>2</sub>
- C) PCl<sub>3</sub>
- D) CCl<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289639>

### Question 845

What is the oxidation number of the sulfur atom in S<sub>8</sub>?

- A) -2
- B) 0
- C) +6
- D) +8

Answer: <https://biology-forums.com/index.php?topic=289247>

### Question 846

If the entropy of a collection of molecules in 5000 boxes is  $1.76 \times 10^{-20}$  J/K, how many molecules are there?

Answer: <https://biology-forums.com/index.php?topic=291057>

### Question 847

KH<sub>2</sub>PO<sub>4</sub> is

- A) hydropotassium phosphate.
- B) potassium dihydrogen phosphate.
- C) potassium diphosphate.
- D) potassium hydrogen(II) phosphate.

Answer: <https://biology-forums.com/index.php?topic=288927>

### Question 848

A reaction with an activation energy,  $E_a = 103$  kJ/mol has a rate constant,  $k = 3.5 \times 10^{-5}$  s<sup>-1</sup> at 25°C. For this reaction the rate constant at 45°C is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290477>

### Question 849

According to the Heisenberg uncertainty principle,

- A) the position of a particle cannot be measured precisely.
- B) the momentum of a particle cannot be measured precisely.
- C) neither the position nor the momentum of a particle can be measured precisely.
- D) the position and momentum of a particle can be measured precisely, but not at the same time.

Answer: <https://biology-forums.com/index.php?topic=289379>

### Question 850

The strongest reducing agent in the group 3A is

- A) B.
- B) Al.
- C) Ga.
- D) Tl.

Answer: <https://biology-forums.com/index.php?topic=291742>

### Question 851

What is geometry around the carbon atom labeled C3?

- A) bent
- B) tetrahedral
- C) trigonal planar
- D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289716>

### Question 852

A gold ingot weighs 5.50 lbs. If the density of gold is 19.31 g/cm<sup>3</sup>, and the length and width of the ingot are 12.0 cm and 3.00 cm respectively, what is the height of the ingot?

- A)  $6.50 \times 10^{-3}$  cm
- B) 3.59 cm
- C) 10.2 cm
- D)  $1.34 \times 10^3$  cm

Answer: <https://biology-forums.com/index.php?topic=288759>

### Question 853

How many grams of KBr are required to make 250. mL of a 0.115 M KBr solution?

- A) 0.242 g
- B) 2.17 g
- C) 3.42 g
- D) 28.8 g

Answer: <https://biology-forums.com/index.php?topic=290289>

### Question 854

A safe method of removing caffeine from coffee is through the use of

- A) supercritical carbon dioxide.
- B) benzene.
- C) methylene chloride.
- D) water.

Answer: <https://biology-forums.com/index.php?topic=290124>

### Question 855

The factor 0.01 corresponds to which prefix?

- A) deka
- B) deci
- C) centi
- D) milli

Answer: <https://biology-forums.com/index.php?topic=288735>

### Question 856

What is the weight percent of a caffeine solution made by dissolving 4.35 g of caffeine, C<sub>8</sub>H<sub>10</sub>N<sub>4</sub>O<sub>2</sub>, in 75 g of benzene, C<sub>6</sub>H<sub>6</sub>?

- A) 0.055%
- B) 0.058%
- C) 5.5%
- D) 5.8%

Answer: <https://biology-forums.com/index.php?topic=290281>

### Question 857

Compare the energies of molecular orbitals of homonuclear diatomic molecules with the energies of the atomic orbitals with which they correlate.

- A) Both bonding and antibonding molecular orbitals lie lower in energy than the atomic orbitals.
- B) Bonding orbitals are lower and antibonding orbitals are higher in energy than the atomic orbitals.
- C) Bonding orbitals are higher and antibonding orbitals are lower in energy than the atomic orbitals.
- D) Both bonding and antibonding molecular orbitals are higher in energy than the atomic orbitals.

Answer: <https://biology-forums.com/index.php?topic=289697>

### Question 858

Which is a net ionic equation for the neutralization of a weak acid with a strong base?

- A)  $\text{HBr(aq)} + \text{NaOH(aq)} \rightleftharpoons \text{H}_2\text{O(l)} + \text{NaBr(aq)}$
- B)  $\text{H}_3\text{O}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightleftharpoons 2 \text{H}_2\text{O(l)}$
- C)  $\text{HF(aq)} + \text{LiOH(aq)} \rightleftharpoons \text{H}_2\text{O(l)} + \text{LiF(aq)}$
- D)  $\text{HF(aq)} + \text{OH}^-(\text{aq}) \rightleftharpoons \text{H}_2\text{O(l)} + \text{F}^-(\text{aq})$

Answer: <https://biology-forums.com/index.php?topic=290884>

### Question 859

When a cell reaction reaches equilibrium,

- A)  $E^\circ = 0$ .
- B)  $E = 0$ .
- C) both  $E^\circ$  and  $E = 0$ .
- D) neither  $E^\circ$  nor  $E = 0$ .

Answer: <https://biology-forums.com/index.php?topic=291144>

### Question 860

Which acid solution has the lowest pH?

- A) HX
- B) HY
- C) HZ
- D) All have the same pH.

Answer: <https://biology-forums.com/index.php?topic=290728>

### Question 861

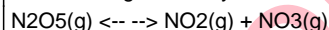
Which statement is true?

- A) The cathode is positive for a galvanic cell and negative for an electrolytic cell.
- B) Electrons flow through the external circuit to the cathode in a galvanic cell and to the anode in an electrolytic cell.
- C) Oxidation occurs at the anode in a galvanic cell and at the cathode in an electrolytic cell.
- D) Oxidation occurs at the cathode in a galvanic cell and at the anode in an electrolytic cell.

Answer: <https://biology-forums.com/index.php?topic=291160>

### Question 862

Which change in the system will drive equilibrium to the left in the reaction below?



- A) decrease the amount of  $\text{NO}_3$
- B) increase the amount of  $\text{N}_2\text{O}_5$
- C) decrease the volume
- D) increase the volume

Answer: <https://biology-forums.com/index.php?topic=290593>

### Question 863

At  $80.0^\circ\text{C}$  benzene has a vapor pressure of 96.0 mm Hg and toluene has a vapor pressure of 30.3 mm Hg. If a mixture of benzene and toluene has a vapor pressure of 54.6 mm Hg, what are the mole fractions of benzene and toluene?

Answer: <https://biology-forums.com/index.php?topic=290340>

### Question 864

A slice of cheese pizza has a caloric content of 550 Cal. If this energy could be used to power a 2500 Watt microwave oven, how many minutes could the microwave oven be operated?  $1 \text{ W} = 1 \text{ J/s}$

- A) 917 min
- B) 15.3 min
- C) 3.00 min
- D) 15 min

Answer: <https://biology-forums.com/index.php?topic=289846>

### Question 865

How would one classify a silicon crystal doped with indium?

- A) conductor
- B) n-type semiconductor
- C) p-type semiconductor
- D) insulator



Answer: <https://biology-forums.com/index.php?topic=291631>

### Question 866

Which of the following species will have the highest ionization energy?

- A) Na<sup>+</sup>
- B) Na<sup>2+</sup>
- C) Na<sup>3+</sup>
- D) Na<sup>4+</sup>

Answer: <https://biology-forums.com/index.php?topic=289540>

### Question 867

Which molecule contains the most polar bonds?

- A) CF<sub>4</sub>
- B) TeO<sub>2</sub>
- C) NO<sup>-</sup>
- D) CCl<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289629>

### Question 868

In an acid-base neutralization reaction 23.74 mL of 0.400 M sodium hydroxide reacts with 50.00 mL of sulfuric acid solution. What is the concentration of the H<sub>2</sub>SO<sub>4</sub> solution?

- A) 0.0950 M
- B) 0.190 M
- C) 0.380 M
- D) 0.760 M

Answer: <https://biology-forums.com/index.php?topic=289267>

### Question 869

How many grams of CO gas are there in a 5.00-L cylinder at  $4.00 \times 10^3$  mm Hg and 23°C?

- A) 15.2 g
- B) 29.9 g
- C) 389 g
- D)  $2.30 \times 10^4$  g

Answer: <https://biology-forums.com/index.php?topic=290006>

### Question 870

Which is a complex ion?

- A) FeBr<sub>3</sub>
- B) CrO<sub>4</sub><sup>2-</sup>
- C) [Cr(H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup>
- D) Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=291564>

### Question 871

Which statement about diluted solutions is false? When a solution is diluted

- A) the concentration of the solution decreases.
- B) the molarity of the solution decreases.
- C) the number of moles of solute remains unchanged.
- D) the number of moles of solvent remains unchanged.

Answer: <https://biology-forums.com/index.php?topic=289209>

### Question 872

What are the F—Se—F bond angles in SeF<sub>6</sub>?

- A) 60°
- B) 90°
- C) 109.5°
- D) 120°

Answer: <https://biology-forums.com/index.php?topic=289727>

### Question 873

The oxidation number of the oxygen atoms in  $\text{CaO}_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291906>

### Question 874

How many unpaired electrons are in an atom of Mt in its ground state?

- A) 1
- B) 2
- C) 3
- D) 5

Answer: <https://biology-forums.com/index.php?topic=289434>

### Question 875

Most elements in the periodic table are

- A) metals.
- B) non-metals.
- C) noble gases.
- D) semi-metals.

Answer: <https://biology-forums.com/index.php?topic=288868>

### Question 876

What is the strongest oxidizing agent of the following set:  $\text{VCl}_2$ ,  $\text{CrCl}_3$ ,  $\text{KMnO}_4$ ,  $\text{KReO}_4$ ?

- A)  $\text{VCl}_2$
- B)  $\text{CrCl}_3$
- C)  $\text{KMnO}_4$
- D)  $\text{KReO}_4$

Answer: <https://biology-forums.com/index.php?topic=291491>

### Question 877

What is the Haber process?

- A) the isolation of  $\text{N}_2$  from the atmosphere
- B) the synthesis of ammonia,  $\text{NH}_3$
- C) the synthesis of nitric acid,  $\text{HNO}_3$
- D) the synthesis of hydrazine,  $\text{N}_2\text{H}_4$

Answer: <https://biology-forums.com/index.php?topic=291785>

### Question 878

At  $50^\circ\text{C}$  the value of  $K_w$  is  $5.5 \times 10^{-14}$ . A basic solution at  $50^\circ\text{C}$  has

- A)  $[\text{H}_3\text{O}^+] < [\text{OH}^-] < 2 \times 10^{-7} \text{ M}$ .
- B)  $[\text{H}_3\text{O}^+] < 2 \times 10^{-7} \text{ M} < [\text{OH}^-]$ .
- C)  $[\text{H}_3\text{O}^+] = [\text{OH}^-] < 2 \times 10^{-7} \text{ M}$ .
- D)  $[\text{H}_3\text{O}^+] > 2 \times 10^{-7} \text{ M} < [\text{OH}^-]$ .

Answer: <https://biology-forums.com/index.php?topic=290650>

### Question 879

The number of moles of  $\text{CaCl}_2$  in 25.0 mL of 0.222 M  $\text{CaCl}_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289339>

### Question 880

Consider two reactants, A and B. The molar mass of A is greater than the molar mass of B. You add equal masses of A and B together and let them react. Which of the following statements must be true?

- A) Reactant A must be limiting.
- B) Reactant B must be limiting.
- C) Reactant A is the excess reactant.
- D) None of the above choices must be true.

Answer: <https://biology-forums.com/index.php?topic=289109>

### Question 881

What is the energy of a wavelength of light of 550 nm?

- A)  $1.09 \times 10^{-31}$  J
- B)  $3.61 \times 10^{-37}$  J
- C)  $3.61 \times 10^{-19}$  J
- D)  $1.09 \times 10^{-22}$  J

Answer: <https://biology-forums.com/index.php?topic=289414>

### Question 882

What is the chemical formula for cesium bicarbonate?

- A)  $\text{Cs}_2\text{HCO}_3$
- B)  $\text{CsHCO}$
- C)  $\text{CsHCO}_2$
- D)  $\text{CsHCO}_3$

Answer: <https://biology-forums.com/index.php?topic=289031>

### Question 883

An acidic solution at 25°C has

- A)  $[\text{H}_3\text{O}^+] > [\text{OH}^-] > 1 \times 10^{-7}$  M.
- B)  $[\text{H}_3\text{O}^+] > 1 \times 10^{-7}$  M  $> [\text{OH}^-]$ .
- C)  $[\text{H}_3\text{O}^+] = [\text{OH}^-] > 1 \times 10^{-7}$  M.
- D)  $[\text{H}_3\text{O}^+] < 1 \times 10^{-7}$  M  $> [\text{OH}^-]$ .

Answer: <https://biology-forums.com/index.php?topic=290649>

### Question 884

Based on formal charges, the P—O bond order in  $\text{POCl}_3$  is expected to be \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289662>

### Question 885

Which of the following regions of the earth's atmosphere is farthest from the surface of the earth?

- A) mesosphere
- B) stratosphere
- C) thermosphere
- D) troposphere

Answer: <https://biology-forums.com/index.php?topic=289979>

### Question 886

The Boltzmann formula is  $S = k \ln W$ . A perfect crystal has a molar entropy of 0 at absolute zero because

- A)  $W = 0$ .
- B)  $W = 1$ .
- C)  $W = \text{NA}$ .
- D)  $k = 1$ .

Answer: <https://biology-forums.com/index.php?topic=290972>

### Question 887

An oxygen molecule has a mass of  $5.3 \times 10^{-26}$  kg and an approximate diameter of  $3.6 \times 10^{-10}$  m. If the molecule is moving at 400 m/s (1000 mph) with an uncertainty in velocity of 1 m/s, the uncertainty in position

- A) is less than or equal to  $5 \times 10^{-26}$  m.
- B) must be equal to  $5 \times 10^{-26}$  m.
- C) must be equal to  $1 \times 10^{-9}$  m.
- D) is greater than or equal to  $1 \times 10^{-9}$  m.

Answer: <https://biology-forums.com/index.php?topic=289381>

### Question 888

The wave characteristics of a large, moving object, such as an automobile, are difficult to observe because the

- A) energy is not quantized.
- B) energy is quantized, but the spacing between energy levels is small.
- C) wavelength is very large.
- D) wavelength is very small.

Answer: <https://biology-forums.com/index.php?topic=289376>

### Question 889

Which statement is false?

- A) For any atom, the 4s orbital lies lower in energy than the 5s orbital.
- B) For a hydrogen atom, a 4s orbital, a 4p orbital, and a 4d orbital all have the same energy.
- C) The 4s orbital lies lower in energy than the 3d orbital for atoms K, Ca, Sc, and Ti.
- D) The 4s orbital lies lower in energy than the 3d orbital for Cu and Fe<sup>2+</sup>.

Answer: <https://biology-forums.com/index.php?topic=289397>

### Question 890

Which one of the following contains 52% carbon by mass?

- A) C<sub>2</sub>H<sub>2</sub>
- B) CH<sub>4</sub>
- C) CH<sub>3</sub>OCH<sub>3</sub>
- D) CO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289177>

### Question 891

Which of the following does not have their valence electrons in the same shell?

- A) S
- B) Ga
- C) Br
- D) As

Answer: <https://biology-forums.com/index.php?topic=289436>

### Question 892

Which of the following is the lowest temperature?

- A) 37°C
- B) 54°F
- C) 313 K
- D) All of these temperatures are all equal.

Answer: <https://biology-forums.com/index.php?topic=288806>

### Question 893

For a process at constant pressure, 24,800 calories of heat are released. This quantity of heat is equivalent to

- A)  $9.64 \times 10^{-6}$  J.
- B)  $5.92 \times 10^3$  J.
- C)  $2.48 \times 10^4$  J.
- D)  $1.04 \times 10^5$  J.

Answer: <https://biology-forums.com/index.php?topic=289842>

### Question 894

Which of the following ionic compounds would be expected to have the highest lattice energy?

- A) CaBr<sub>2</sub>
- B) NaBr
- C) KBr
- D) RbBr

Answer: <https://biology-forums.com/index.php?topic=289558>

### Question 895

The intermolecular forces responsible for CH<sub>3</sub>CH<sub>2</sub>OH being at liquid at 20°C are \_\_\_\_\_ bonds.

Answer: <https://biology-forums.com/index.php?topic=289770>

### Question 896

What is the identity of the element with 6 protons, 7 neutrons, and 6 electrons?

- A) C
- B) N
- C) Al
- D) Mg

Answer: <https://biology-forums.com/index.php?topic=288904>

### Question 897

Why is  $\text{CaCO}_3$  added to a blast furnace in the steel making process?

- A) to give a source of  $\text{CO}_2$
- B) to remove basic oxides from the iron ore
- C) to remove silicates and phosphates from the iron ore
- D) to remove unreactive carbon from the iron ore

Answer: <https://biology-forums.com/index.php?topic=291613>

### Question 898

What does the term "essential" mean when referring to amino acids? These are the amino acids which

- A) are necessary for digestion.
- B) are necessary for respiration.
- C) are synthesized in our bodies.
- D) we must obtain from our diet.

Answer: <https://biology-forums.com/index.php?topic=291971>

### Question 899

The first transition series element expected to have the lowest second ionization energy is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291587>

### Question 900

Which of the following is a weak diprotic acids?

- A) HCN
- B)  $\text{H}_2\text{CO}_3$
- C)  $\text{H}_2\text{CO}_3$
- D)  $\text{H}_2\text{SO}_3$

Answer: <https://biology-forums.com/index.php?topic=290781>

### Question 901

Which of the following ions has the greater effective nuclear charge?

- A)  $\text{V}^{3+}$
- B)  $\text{Cr}^{3+}$
- C)  $\text{Fe}^{3+}$
- D)  $\text{Co}^{3+}$

Answer: <https://biology-forums.com/index.php?topic=291493>

### Question 902

Combustion of hydrogen releases 142 kJ per gram of hydrogen reacted. How many kilocalories of energy are released by the combustion of 16.0 ounces of hydrogen?

- A) 1.31 kcal
- B) 19.2 kcal
- C)  $1.54 \times 10^4$  kcal
- D)  $2.69 \times 10^5$  kcal

Answer: <https://biology-forums.com/index.php?topic=288779>

### Question 903

How many  $\text{Br}^-$  ions are around each  $\text{K}^+$  ion in KBr, which has a cubic unit cell with  $\text{Br}^-$  ions on each corner and each face?

- A) 1
- B) 4
- C) 6
- D) 8

Answer: <https://biology-forums.com/index.php?topic=290117>

### Question 904

What is the molar concentration of sodium ions in a 0.350 M  $\text{Na}_3\text{PO}_4$  solution?

- A) 0.117 M
- B) 0.350 M

C) 1.05 M

D) 1.40 M

Answer: <https://biology-forums.com/index.php?topic=289216>

### Question 905

Redox reactions occurring in acid are evident by the appearance of \_\_\_\_\_ in the balanced equation, and redox reactions occurring in base are evident by the appearance of \_\_\_\_\_ in the balanced equation.

Answer: <https://biology-forums.com/index.php?topic=291246>

### Question 906

Which compound is a ketone?

A) butanal

B) propanoic acid

C) 2-butanone

D) butane

Answer: <https://biology-forums.com/index.php?topic=291990>

### Question 907

Which alkali metal forms preferentially an oxide rather than a peroxide or superoxide?

A) Li

B) Na

C) K

D) Mg

Answer: <https://biology-forums.com/index.php?topic=291867>

### Question 908

Which of the following statements concerning a lithium battery is false?

A) A lithium battery is rechargeable.

B) A lithium battery has a relatively high voltage, due in part to the high oxidation potential of lithium.

C) It takes a small mass of lithium to provide one mole of electrons in the cell reaction.

D) The cell reaction produces toxic mercury, so the batteries should be recycled.

Answer: <https://biology-forums.com/index.php?topic=291152>

### Question 909

A student prepared a stock solution by dissolving 20.0 g of NaOH in enough water to make 150. mL of solution. She then took 15.0 mL of the stock solution and diluted it with enough water to make 65.0 mL of a final solution. What is the concentration of NaOH for the final solution?

A) 0.769 M

B) 0.548 M

C) 1.40 M

D) 1.82 M

Answer: <https://biology-forums.com/index.php?topic=289212>

### Question 910

Of the bonds C—C, C—N, C—O, and C—F, the bond that is most polar is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289654>

### Question 911

Which of the following statements are true about elements with metallic character?

A) Elements with a low ionization energy are more likely to be nonmetallic.

B) Elements with a high electronegativity are more likely to be metallic.

C) Elements with a high electronegativity and low ionization energy are more likely to be metallic.

D) Elements with a low electronegativity, low ionization energy, and malleability are more likely to be metallic.

Answer: <https://biology-forums.com/index.php?topic=291715>

### Question 912

Which has the highest melting point?

A) Sc

B) V

C) Mn

D) Zn

Answer: <https://biology-forums.com/index.php?topic=291524>

### Question 913

Why are ceramics so much more brittle than metals?

- A) The bonding in ceramics has a very high degree of ionic bonding character.
- B) The bonding in ceramics has a very high degree of pi bonding character.
- C) The bonding in ceramics is highly nondirectional.
- D) The localized bonding in ceramics is highly directional.

Answer: <https://biology-forums.com/index.php?topic=291648>

### Question 914

Indicate which is larger in each of the following two sets.

- (I) Cr<sup>2+</sup> or Cr (II) N<sup>2-</sup> or N
- A) Cr<sup>2+</sup> is larger than Cr and N<sup>3-</sup> is larger than N.
- B) Cr<sup>2+</sup> is larger than Cr and N is larger than N<sup>3-</sup>.
- C) Cr is larger than Cr<sup>2+</sup> and N<sup>3-</sup> is larger than N.
- D) Cr is larger than Cr<sup>2+</sup> and N is larger than N<sup>3-</sup>.

Answer: <https://biology-forums.com/index.php?topic=289531>

### Question 915

The equilibrium equation is also known as the law of

- A) coefficients.
- B) constant concentration.
- C) dynamic equilibrium.
- D) mass action.

Answer: <https://biology-forums.com/index.php?topic=290485>

### Question 916

Which of the following statements about cycloalkanes is true?

- A) The bonds in cyclopropane and cyclobutane are weaker than other cycloalkanes.
- B) Cycloalkanes are also called "acyclic" compounds.
- C) Cyclopropane has 109° bond angles.
- D) Most cycloalkanes are planar molecules.

Answer: <https://biology-forums.com/index.php?topic=291940>

### Question 917

Each of three identical 15.0-L gas cylinders contains 7.50 mol of gas at 295 K. Cylinder A contains Ar, cylinder B contains Cl<sub>2</sub>, and cylinder C contains N<sub>2</sub>. According to the kinetic molecular theory, which gas has the highest collision frequency?

- A) Ar
- B) Cl<sub>2</sub>
- C) N<sub>2</sub>
- D) All have identical collision frequencies

Answer: <https://biology-forums.com/index.php?topic=289972>

### Question 918

Which has the largest atomic radius?

- A) Sc
- B) V
- C) Ni
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291526>

### Question 919

What is the silver ion concentration for a saturated solution of SrF<sub>2</sub> if the K<sub>sp</sub> for SrF<sub>2</sub> is

- A)  $9.3 \times 10^{-7}$  M
- B)  $1.4 \times 10^{-3}$  M
- C)  $8.5 \times 10^{-4}$  M
- D)  $4.06 \times 10^{-4}$  M

Answer: <https://biology-forums.com/index.php?topic=290922>

### Question 920

Which of the following elements exhibits the most metallic character?

- A) B
- B) C
- C) N
- D) O

Answer: <https://biology-forums.com/index.php?topic=291841>

### Question 921

Second row elements differ from heavier elements in all of the following ways except

- A) atoms of second row elements are smaller.
- B) atoms of second row elements have higher electronegativities.
- C) heavier elements commonly form multiple bonds while second row elements cannot.
- D) heavier elements have electrons in d orbitals while second row elements do not.

Answer: <https://biology-forums.com/index.php?topic=291718>

### Question 922

How many electrons are in the outermost shell of the K<sup>+</sup> ion in its ground state?

- A) 0
- B) 2
- C) 6
- D) 8

Answer: <https://biology-forums.com/index.php?topic=289526>

### Question 923

A crystalline solid of unknown origin forms an aqueous solution that conducts an electrical current. The solid has a high melting point and shatters when struck with a hammer. The solid is likely to be

- A) a covalent network solid.
- B) an ionic solid.
- C) a metallic solid.
- D) a molecular solid.

Answer: <https://biology-forums.com/index.php?topic=290096>

### Question 924

The critical temperature of a substance is the

- A) highest temperature at which the liquid phase can exist in equilibrium with the gas phase.
- B) temperature above which the compound decomposes.
- C) temperature at which all three phases can exist in equilibrium.
- D) temperature at which sublimation occurs.

Answer: <https://biology-forums.com/index.php?topic=290121>

### Question 925

When dissolved in water, of HClO<sub>4</sub>, NH<sub>3</sub>, KOH, HI, and CH<sub>3</sub>OH which are bases?

- A) NH<sub>3</sub> and KOH
- B) HClO<sub>4</sub> and HI
- C) only HI
- D) NH<sub>3</sub>, KOH, and CH<sub>3</sub>OH

Answer: <https://biology-forums.com/index.php?topic=289232>

### Question 926

According to the second law of thermodynamics, all reactions proceed spontaneously in the direction that increases the entropy of the

- A) surroundings.
- B) surroundings x system.
- C) system - surroundings.
- D) system + surroundings.

Answer: <https://biology-forums.com/index.php?topic=291042>

### Question 927



Using only the elements Mg, Cl, and/or P, give the formula of a compound having largely polar covalent bonds.

Answer: <https://biology-forums.com/index.php?topic=289653>

### Question 928

For acid solutions of the same molarity acid strength is proportional to the equilibrium concentration of  $H_3O^+$ . For equimolar solutions of acids, which equilibrium expression below corresponds to the strongest acid?

- A)  $K_c = 3.5 \times 10^{-4}$
- B)  $K_c = 3.5 \times 10^{-8}$
- C)  $K_c = 4.5 \times 10^{-4}$
- D)  $K_c = 4.9 \times 10^{-10}$

Answer: <https://biology-forums.com/index.php?topic=290546>

### Question 929

Which element will not react with liquid water or with aqueous  $H^+$  ions?

- A) Hg
- B) Co
- C) Zn
- D) Li

Answer: <https://biology-forums.com/index.php?topic=289334>

### Question 930

The osmotic pressure of a 0.10 M solution of sucrose,  $C_{12}H_{22}O_{11}$  will be \_\_\_\_\_ (equal to, greater than, less than) the osmotic pressure of a 0.10 M solution of fructose,  $C_6H_{12}O_6$ .

Answer: <https://biology-forums.com/index.php?topic=290346>

### Question 931

Interhalogen compounds can be produced by reacting two different halogens together. Which one of the following compounds does not exist?

- A)  $ClF$
- B)  $ClBr$
- C)  $ClBr_3$
- D)  $IF_3$

Answer: <https://biology-forums.com/index.php?topic=291829>

### Question 932

The solution formed upon adding 80.00 mL of 0.50 M  $NH_4Cl$  to 80.00 mL of 0.50 M  $NH_3$  will have a pH that is \_\_\_\_\_ the pH of the original  $NH_3$  solution.

Answer: <https://biology-forums.com/index.php?topic=290936>

### Question 933

A reaction with an activation energy,  $E_a = 51.2$  kJ/mol will proceed \_\_\_\_\_ times faster when the temperature is raised from 20 °C to 30 °C.

Answer: <https://biology-forums.com/index.php?topic=290476>

### Question 934

At 1000 K,  $K_p = 19.9$  for the reaction  $Fe_2O_3(s) + 3 CO(g) \rightleftharpoons 2 Fe(s) + 3 CO_2(g)$ . What is the value of  $K_p$  for the reaction  $2 Fe_2O_3(s) + 6 CO(g) \rightleftharpoons 4 Fe(s) + 6 CO_2(g)$ ?

Answer: <https://biology-forums.com/index.php?topic=290610>

### Question 935

Which orbitals do not have a node at the nucleus?

- A) all beyond the second shell
- B) s and d
- C) d
- D) s

Answer: <https://biology-forums.com/index.php?topic=289424>

### Question 936

To make a 0.125 M solution, one could take 0.125 moles of solute and add

- A) 1.00 L of solvent.
- B) 1.00 kg of solvent.

C) enough solvent to make 1.00 L of solution.

D) enough solvent to make 1.00 kg of solution.

Answer: <https://biology-forums.com/index.php?topic=290285>

### Question 937

According to history, the concept that all matter is composed of atoms was first proposed by

A) the Greek philosopher Democritus, but not widely accepted until modern times.

B) Dalton, but not widely accepted until the work of Mendeleev.

C) Dalton, but not widely accepted until the work of Einstein.

D) Dalton, and widely accepted within a few decades.

Answer: <https://biology-forums.com/index.php?topic=288863>

### Question 938

Which one of the following is most penetrating?

A) alpha particles

B) beta particles

C) gamma rays

D) positrons

Answer: <https://biology-forums.com/index.php?topic=291394>

### Question 939

What is the expected freezing point of a 0.50 m solution of  $\text{Na}_2\text{CO}_3$  in water?  $K_f$  for water is  $1.86^\circ\text{C}/\text{m}$ .

A)  $-0.93^\circ\text{C}$

B)  $-1.9^\circ\text{C}$

C)  $-2.8^\circ\text{C}$

D)  $-6.5^\circ\text{C}$

Answer: <https://biology-forums.com/index.php?topic=290247>

### Question 940

Which has the smallest atomic radius?

A) Sc

B) V

C) Ni

D) Zn

Answer: <https://biology-forums.com/index.php?topic=291527>

### Question 941

A piece of metal ore weighs 7.25 g. When a student places it into a graduated cylinder containing water, the liquid level rises from 21.25 mL to 25.00 mL. What is the density of the ore?

A) 0.281 g/mL

B) 0.141 g/mL

C) 1.93 g/mL

D) 3.21 g/mL

Answer: <https://biology-forums.com/index.php?topic=288817>

### Question 942

Suppose you needed to closely monitor small changes in pressure inside a container using an open end manometer. For the best accuracy, the substance in the manometer should

A) be a solid.

B) be mercury.

C) have a high density.

D) have a low density.

Answer: <https://biology-forums.com/index.php?topic=289916>

### Question 943

The boiling point of a solution containing a nonvolatile solute will be \_\_\_\_\_ than the boiling point of the pure solvent, whereas the boiling point of a solution of two volatile liquids will be \_\_\_\_\_ than the boiling point of the more volatile liquid and \_\_\_\_\_ than the boiling point of the less volatile liquid.

Answer: <https://biology-forums.com/index.php?topic=290344>

### Question 944

Chemical and physical changes can be classified as spontaneous or nonspontaneous. At 25°C and 1 atm pressure the decomposition of water into hydrogen and oxygen is classified as \_\_\_\_\_, and the melting of snow is classified as \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291052>

### Question 945

For a particular compound, which is expected to be the largest in general?

- A) the heat required to raise the temperature of one mole of the gas 10.0°C
- B) the heat required to raise the temperature of one mole of the liquid 10.0°C
- C) the molar heat of fusion at the normal melting point
- D) the molar heat of vaporization at the normal boiling point

Answer: <https://biology-forums.com/index.php?topic=290077>

### Question 946

Composite materials can be classified as ceramic-ceramic, ceramic-metal, or ceramic-polymer. Silicon carbide-reinforced alumina is classified as \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291705>

### Question 947

Assume that the vapor at point c is condensed and reboiled. What is the liquid composition of the condensed vapor prior to reboiling?

- A) 100% decane
- B) composition at point b
- C) composition at point d
- D) composition at point e

Answer: <https://biology-forums.com/index.php?topic=290266>

### Question 948

Which combination of semiconductors can be employed to make a diode?

- A) GaAs doped with Ge and GaP doped with Si
- B) GaAs doped with Se and GaP doped with Zn
- C) Si doped with B and Ge doped with Ga
- D) Si doped with P and Ge doped with As

Answer: <https://biology-forums.com/index.php?topic=291635>

### Question 949

The property of a liquid that is a measure of the liquid's resistance to increase its surface area is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290168>

### Question 950

Iridium crystallizes in a face-centered cubic structure. What is the edge length of the unit cell if the atomic radius of silver is 180 pm?

- A) 441 pm
- B) 64 pm
- C) 38 pm
- D) 509 pm

Answer: <https://biology-forums.com/index.php?topic=290107>

### Question 951

The activation energy for the forward reaction is given by the difference in energy between which two reaction stages?

- A) reaction stage 2 — reaction stage 1
- B) reaction stage 2 — reaction stage 3
- C) reaction stage 1 — reaction stage 3
- D) reaction stage 3 — reaction stage 1

Answer: <https://biology-forums.com/index.php?topic=290416>

### Question 952

Which of the following elements would you predict to have an anomalous electron configuration?

- A) W
- B) Mg

- C) Al
- D) Sb

Answer: <https://biology-forums.com/index.php?topic=289432>

### Question 953

How many subshells are there in the shell with  $n = 6$ ?

- A) 5
- B) 6
- C) 15
- D) 36

Answer: <https://biology-forums.com/index.php?topic=289385>

### Question 954

Normal rainfall has a concentration of  $\text{OH}^-$  that is  $3.99 \times 10^{-9}$ . The concentration of  $\text{H}_3\text{O}^+$  in normal rainfall is

- A) greater than  $3.99 \times 10^{-9}$ , and the rain is acidic.
- B) greater than  $3.99 \times 10^{-9}$ , and the rain is basic.
- C) less than  $3.99 \times 10^{-9}$ , and the rain is acidic.
- D) less than  $3.99 \times 10^{-9}$ , and the rain is basic.

Answer: <https://biology-forums.com/index.php?topic=290753>

### Question 955

What orbital hybridization is expected for the central atom in a molecule with a trigonal planar geometry?

- A) sp
- B)  $\text{sp}^2$
- C)  $\text{sp}^3$
- D)  $\text{sp}^4$

Answer: <https://biology-forums.com/index.php?topic=289734>

### Question 956

Pressure is defined as

- A) force divided by unit area.
- B) force times unit area.
- C) mass divided by acceleration.
- D) mass times acceleration.

Answer: <https://biology-forums.com/index.php?topic=289912>

### Question 957

Which of the following elements is an inner transition metal?

- A) Pm
- B) Ni
- C) Zr
- D) Lu

Answer: <https://biology-forums.com/index.php?topic=291549>

### Question 958

Addition of a small amount of As impurity in silicon results in a(n) \_\_\_\_\_-type semiconductor that has a conductivity that is \_\_\_\_\_ (greater, less) than silicon.

Answer: <https://biology-forums.com/index.php?topic=291694>

### Question 959

Steel is galvanized by giving it a surface coating of zinc. Galvanized steel is an example of

- A) a compound.
- B) an element.
- C) a mixture.
- D) an ion.

Answer: <https://biology-forums.com/index.php?topic=288910>

### Question 960

Which transition could occur if a solid is heated at a pressure above the triple point pressure?

- A) vaporization
- B) deposition
- C) melting
- D) sublimation

Answer: <https://biology-forums.com/index.php?topic=290167>

### Question 961

Which is the largest amount of heat?

- A) 547 cal
- B)  $8.32 \times 102$  kcal
- C)  $6.66 \times 102$  J
- D) 4.33 kJ

Answer: <https://biology-forums.com/index.php?topic=288821>

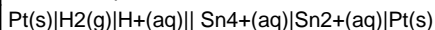
### Question 962

Inner transition elements are found in the \_\_\_\_\_-block of the periodic table.

Answer: <https://biology-forums.com/index.php?topic=291579>

### Question 963

The galvanic cell represented by the shorthand notation below contains  $\text{KNO}_3(\text{aq})$  in the salt bridge. During the reaction \_\_\_\_\_ ions flow into the anode compartment, and \_\_\_\_\_ ions flow into the cathode compartment.



Answer: <https://biology-forums.com/index.php?topic=291279>

### Question 964

The volume of 350. mL of gas at  $25^\circ\text{C}$  is decreased to 125 mL at constant pressure. What is the final temperature of the gas?

- A)  $-167^\circ\text{C}$
- B)  $8.9^\circ\text{C}$
- C)  $70^\circ\text{C}$
- D)  $561^\circ\text{C}$

Answer: <https://biology-forums.com/index.php?topic=289995>

### Question 965

Why is silicon dioxide added to molten iron in the basic oxygen process?

- A) to remove acidic oxides from the molten iron
- B) to remove manganese oxide from the molten iron
- C) to remove phosphates and carbonates from the molten iron
- D) to remove trace amounts of carbon from the molten iron

Answer: <https://biology-forums.com/index.php?topic=291614>

### Question 966

What is the pH of a solution prepared by mixing 50.00 mL of 0.10 M  $\text{NH}_3$  with 20.00 mL of 0.10 M  $\text{NH}_4\text{Cl}$ ? Assume that the volume of the solutions are additive and that  $K_b = 1.8 \times 10^{-5}$  for  $\text{NH}_3$ .

- A) 8.86
- B) 10.26
- C) 9.65
- D) 11.13

Answer: <https://biology-forums.com/index.php?topic=290895>

### Question 967

What element was one of the "holes" in Mendeleev's periodic table?

- A) Si
- B) Ge
- C) Sn
- D) Pb

Answer: <https://biology-forums.com/index.php?topic=291761>

### Question 968

The change in the Gibbs free energy for dissolving more solute in a supersaturated solution is

- A) negative.
- B) zero.
- C) positive.
- D) positive at low temperatures and negative at high temperatures.

Answer: <https://biology-forums.com/index.php?topic=290197>

### Question 969

Which of the following amino acids contains a sulfur in its side chain?

- A) aspartic acid
- B) glycine
- C) cysteine
- D) arginine

Answer: <https://biology-forums.com/index.php?topic=292038>

### Question 970

What is the charge on the Sc ions in Sc<sub>2</sub>O<sub>3</sub>?

- A) 2-
- B) 1+
- C) 2+
- D) 3+

Answer: <https://biology-forums.com/index.php?topic=289009>

### Question 971

The laser used to read Blu-Ray discs have a wavelength of 405 nm. 405 nm photons have of an energy of \_\_\_\_\_ J, and a mole of 405 nm photons has an energy of \_\_\_\_\_ kJ/mol.

Answer: <https://biology-forums.com/index.php?topic=289455>

### Question 972

What is the strongest acid among the following?

- A) CH<sub>3</sub>CO<sub>2</sub>H
- B) ClCH<sub>2</sub>CO<sub>2</sub>H
- C) Cl<sub>2</sub>CHCO<sub>2</sub>H
- D) Cl<sub>3</sub>CCO<sub>2</sub>H

Answer: <https://biology-forums.com/index.php?topic=290748>

### Question 973

Which of the following gases has the highest average speed at 400K?

- A) HCN
- B) O<sub>2</sub>
- C) Xe
- D) BF<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290032>

### Question 974

Aniline, (C<sub>6</sub>H<sub>5</sub>NH<sub>2</sub>, K<sub>b</sub> = 4.3 × 10<sup>-10</sup> at 25°C) is an industrially important amine used in the making of dyes. Determine the pH of an aniline solution made by dissolving 3.90 g of aniline in enough water to make 100 mL of solution.

- A) 4.87
- B) 9.13
- C) 9.74
- D) 10.74

Answer: <https://biology-forums.com/index.php?topic=290784>

### Question 975

What are the molecular structures of orthophosphoric acid and pyrophosphoric acid?

- A) 1 and 2
- B) 1 and 3
- C) 2 and 3
- D) 3 and 4

Answer: <https://biology-forums.com/index.php?topic=291798>

### Question 976

Silver oxalate,  $\text{Ag}_2\text{C}_2\text{O}_4$ , has a molar solubility =  $1.1 \times 10^{-4}$  mol/L.  $\text{Ag}_2\text{C}_2\text{O}_4$  has a solubility product  $K_{sp}$  = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290950>

### Question 977

An element that has the valence electron configuration  $2s^2 2p^2$  belongs to which period and group?

- A) period 2; group 2A
- B) period 2; group 4A
- C) period 3; group 2A
- D) period 3; group 4A

Answer: <https://biology-forums.com/index.php?topic=289547>

### Question 978

What is not a metallurgy process?

- A) environmental reconstruction of the landscape
- B) extraction of metals from their ores
- C) making of alloys and metallic composites
- D) reduction of the mineral to the free metal

Answer: <https://biology-forums.com/index.php?topic=291601>

### Question 979

Using exponential notation, there are \_\_\_\_\_ g in 1.5 mg.

Answer: <https://biology-forums.com/index.php?topic=288847>

### Question 980

Isotopes have the same number of \_\_\_\_\_ but different numbers of \_\_\_\_\_ in their nuclei.

Answer: <https://biology-forums.com/index.php?topic=289050>

### Question 981

Phosphorus pentachloride decomposes to phosphorus trichloride and chlorine gas at elevated temperatures by the following reaction:

$\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$ . If  $K_c = 1.8$  at  $250^\circ\text{C}$ .

What is the value of  $K_p$  at the same temperature?

- A)  $4.2 \times 10^{-2}$
- B)  $8.8 \times 10^{-2}$
- C) 65
- D) 77

Answer: <https://biology-forums.com/index.php?topic=290507>

### Question 982

The empirical formula of a compound that contains 82.66% carbon and 17.34% hydrogen is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289202>

### Question 983

Of the following, which element has the highest first ionization energy?

- A) Li
- B) F
- C) Cs
- D) At

Answer: <https://biology-forums.com/index.php?topic=289488>

### Question 984

Aqueous solutions of 30.0% (by weight) hydrogen peroxide,  $\text{H}_2\text{O}_2$ , are used to oxidize metals or organic molecules in chemical reactions. Calculate the molality of this solution.

- A) 0.974 m
- B) 6.78 m
- C) 9.79 m
- D) 12.6 m

Answer: <https://biology-forums.com/index.php?topic=290225>

### Question 985

The heat of vaporization of water at 100°C is 40.66 kJ/mol. Calculate the quantity of heat that is absorbed/released when 20.00 g of steam condenses to liquid water at 100°C.

- A) 45.2 kJ of heat are absorbed.
- B) 45.2 kJ of heat are released.
- C) 813.2 kJ of heat are absorbed.
- D) 813.2 kJ of heat are released.

Answer: <https://biology-forums.com/index.php?topic=289804>

### Question 986

What is geometry around the nitrogen atom?

- A) bent
- B) tetrahedral
- C) trigonal planar
- D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289718>

### Question 987

Which element has the chemical symbol, N?

- A) nickel
- B) niobium
- C) nitrogen
- D) nobelium

Answer: <https://biology-forums.com/index.php?topic=288939>

### Question 988

To the correct number of significant figures, an automobile traveling at 28 mi/h is traveling at \_\_\_\_\_ km/h (1 km = 0.6214 mi).

- A) 17
- B) 17.40
- C) 45
- D) 45.06

Answer: <https://biology-forums.com/index.php?topic=288768>

### Question 989

In which blocks of the periodic table are the transition series and inner transition series elements found?

- A) d, p
- B) d, f
- C) s, d
- D) s, p

Answer: <https://biology-forums.com/index.php?topic=291481>

### Question 990

Which of the following substances has increased markedly due to the use of fossil fuels and contributes to the greenhouse effect?

- A) CO<sub>2</sub>
- B) SO<sub>2</sub>
- C) NO<sub>2</sub>
- D) O<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=289985>

### Question 991

For the reaction  $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{O}_2(\text{g})$  the equilibrium expression is  $K_p = \underline{\hspace{2cm}}$ .

Answer: <https://biology-forums.com/index.php?topic=290606>

### Question 992

According to Table 17.1, which will reduce water but not Mg<sup>2+</sup>?

- A) Al<sup>3+</sup>(aq)
- B) Al(s)
- C) Na<sup>+</sup>(aq)



D) Na(s)

Answer: <https://biology-forums.com/index.php?topic=291124>

### Question 993

Copper can be obtained from its copper(I) sulfide ore by roasting. What is the balanced equation for the roasting of copper(I) sulfide?

Answer: <https://biology-forums.com/index.php?topic=291687>

### Question 994

A solution is 4.50% by weight  $\text{NaHCO}_3$ . How many grams of  $\text{NaHCO}_3$  are in 450.0 g of solution?

- A) 1.000 g
- B) 20.2 g
- C) 400 g
- D) 450 g

Answer: <https://biology-forums.com/index.php?topic=290221>

### Question 995

Which of the following compounds exhibits only dispersion and dipole-dipole intermolecular interactions?

- A) Na
- B) HCl
- C)  $\text{BH}_3$
- D)  $\text{CH}_3\text{NHC}_4\text{H}_9$

Answer: <https://biology-forums.com/index.php?topic=289751>

### Question 996

Metals that do not react with hydrochloric acid to produce hydrogen gas are found \_\_\_\_\_  $\text{H}_2$  in the activity series.

Answer: <https://biology-forums.com/index.php?topic=289358>

### Question 997

What reagent would distinguish between  $\text{Ag}^+$  and  $\text{Fe}^{3+}$ ?

- A)  $\text{NaClO}_3$
- B) NaI
- C)  $\text{NaNO}_3$
- D) NaOH

Answer: <https://biology-forums.com/index.php?topic=289224>

### Question 998

The hybrid orbital used by nitrogen to overlap with the 1s orbital of hydrogen in  $\text{CH}_3\text{NH}_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289760>

### Question 999

Solids having no ordered long-range structure are classified as

- A) amorphous solids.
- B) crystalline solids.
- C) nonmetallic solids.
- D) covalent network solids.

Answer: <https://biology-forums.com/index.php?topic=290149>

### Question 1000

Which one of the following compounds behaves as an acid when dissolved in water?

- A)  $\text{CH}_3\text{OCH}_3$
- B)  $\text{CH}_4$
- C)  $\text{H}_2\text{SO}_3$
- D) KOH

Answer: <https://biology-forums.com/index.php?topic=289230>

### Question 1001

At 298 K the average kinetic energy is the same for  $\text{H}_2$ , He, and  $\text{N}_2$ . The gas with the highest average velocity is

- A)  $\text{H}_2$ .
- B) Kr.

- C) Cl<sub>2</sub>.  
D) All have the same average velocity.

Answer: <https://biology-forums.com/index.php?topic=289843>

### Question 1002

Al<sub>2</sub>O<sub>3</sub> can be separated from iron oxide impurities in bauxite by dissolving the Al<sub>2</sub>O<sub>3</sub> in hot aqueous NaOH. Give the formula of the aluminum complex ion that forms, and write a balanced net ionic equation for its formation by the reaction between Al<sub>2</sub>O<sub>3</sub> and NaOH.

Answer: <https://biology-forums.com/index.php?topic=291689>

### Question 1003

What is the chemical formula for calcium chromate?

- A) CaCrO<sub>2</sub>  
B) CaCrO  
C) CaCrO<sub>3</sub>  
D) CaCrO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289032>

### Question 1004

Which of the following would have a density of 1.89 g/L at 7.0°C and 0.987 atm?

- A) Ar  
B) CO<sub>2</sub>  
C) CO  
D) O<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289947>

### Question 1005

Which battery does not use MnO<sub>2</sub>(s) as a cell reactant?

- A) an alkaline cell  
B) an alkaline dry cell  
C) a lithium battery  
D) a nickel-metal hydride battery

Answer: <https://biology-forums.com/index.php?topic=291237>

### Question 1006

At 25.0°C, a solution has a concentration of 3.179 M and a density of 1.260 g/mL. The density of the solution at 50.0°C is 1.249 g/mL. What is the molarity of the solution at 50.0°C?

- A) 2.545 M  
B) 3.151 M  
C) 3.179 M  
D) 3.230 M

Answer: <https://biology-forums.com/index.php?topic=290232>

### Question 1007

The number of neutrons in Fe<sup>2+</sup> is

- A) 26.  
B) 36.  
C) 60.  
D) 62.

Answer: <https://biology-forums.com/index.php?topic=291420>

### Question 1008

What is the smallest bond angle in SF<sub>6</sub>?

- A) 60°  
B) 90°  
C) 109.5°  
D) 120°

Answer: <https://biology-forums.com/index.php?topic=289668>

### Question 1009

In the dark the reaction of 2-pentene with bromine will form how many different products?

Answer: <https://biology-forums.com/index.php?topic=292053>

### Question 1010

Three atoms have the following properties.

Proton Neutron Electron

Atom X 119 119 119

Atom Y 119 118 119

Atom Z 118 118 119

The elements X and Y are best described as

- A) isotopes.
- B) cations.
- C) different elements.
- D) anions.

Answer: <https://biology-forums.com/index.php?topic=288901>

### Question 1011

Which of the following statements concerning ionic compounds is true?

- A) Essentially all ionic compounds are solids at room temperature and pressure.
- B) Ionic compounds do not contain any covalent bonds.
- C) Ionic compounds contain the same number of positive ions as negative ions.
- D) The chemical formula for an ionic compound must show a nonzero net charge.

Answer: <https://biology-forums.com/index.php?topic=288918>

### Question 1012

Which one of the following contains a polar carbonyl group, C=O?

- A) a carboxylic acid
- B) an alkyne
- C) an amine
- D) an alkane

Answer: <https://biology-forums.com/index.php?topic=291992>

### Question 1013

1.00 mole of O<sub>2</sub> contains the same number of molecules as

- A) 0.667 mole of O<sub>3</sub>.
- B) 1.00 mole of CH<sub>3</sub>CO<sub>2</sub>CH<sub>2</sub>Cl.
- C) 2.00 mole of CH<sub>3</sub>CH<sub>2</sub>OCH<sub>2</sub>Br.
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=289156>

### Question 1014

Of the following, which atom has the smallest atomic radius?

- A) Ca
- B) As
- C) Mn
- D) Ni

Answer: <https://biology-forums.com/index.php?topic=289449>

### Question 1015

Calculate the pH for an aqueous solution of pyridine that contains  $2.15 \times 10^{-4}$  M hydroxide ion.

- A)  $4.65 \times 10^{-11}$
- B)  $2.15 \times 10^{-4}$
- C) 3.67
- D) 10.33

Answer: <https://biology-forums.com/index.php?topic=290660>

### Question 1016

Rubber is classified as an \_\_\_\_\_ solid, whereas diamond is classified as a \_\_\_\_\_ solid.

Answer: <https://biology-forums.com/index.php?topic=290173>

### Question 1017

How many carbons are found in a molecule that contains the prefix but-?

- A) 2
- B) 4
- C) 3
- D) 7

Answer: <https://biology-forums.com/index.php?topic=291947>

### Question 1018

Light emitting diodes (LEDs) used in automobile brake lights illuminate 200 milliseconds faster than conventional incandescent brake lights. The faster illumination gives the driver of a trailing car an additional stopping distance of \_\_\_\_\_ feet at 55 mph.

Answer: <https://biology-forums.com/index.php?topic=291698>

### Question 1019

Organic molecules containing only carbon and hydrogen and having only single bonds are called \_\_\_\_\_ hydrocarbons, or \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292048>

### Question 1020

Identify the conjugate acid/base pairs present in an aqueous solution of hydrogen sulfate ion,  $\text{HSO}_4^-$ .

- A)  $\text{HSO}_4^-/\text{SO}_4^{2-}$  and  $\text{H}_3\text{O}^+/\text{H}_2\text{O}$
- B)  $\text{H}_2\text{SO}_4/\text{HSO}_4^-$  and  $\text{H}_2\text{O}/\text{OH}^-$
- C)  $\text{HSO}_4^-/\text{H}_2\text{O}$  and  $\text{H}_3\text{O}^+/\text{SO}_4^{2-}$
- D)  $\text{HSO}_4^-/\text{H}_2\text{O}$  and  $\text{H}_2\text{SO}_4/\text{OH}^-$

Answer: <https://biology-forums.com/index.php?topic=290631>

### Question 1021

What is the weight percent of vitamin C in a solution made by dissolving 1.30 g of vitamin C,  $\text{C}_6\text{H}_8\text{O}_6$ , in 55.0 g of water?

- A) 0.195%
- B) 0.242%
- C) 2.31%
- D) 2.36%

Answer: <https://biology-forums.com/index.php?topic=290280>

### Question 1022

The human body can synthesize \_\_\_\_\_ amino acids.

- A) 3
- B) 11
- C) 8
- D) 15

Answer: <https://biology-forums.com/index.php?topic=292027>

### Question 1023

The density of aluminum is  $2.702 \text{ g/cm}^3$ . What is the final liquid level of water if 1.130 ounces of aluminum is dropped into a graduated cylinder containing 15.90 mL of water?

- A) 17.08 mL
- B) 21.66 mL
- C) 27.76 mL
- D) 47.95 mL

Answer: <https://biology-forums.com/index.php?topic=288756>

### Question 1024

The concentration of  $\text{H}_3\text{O}^+$  in human sweat can be as low as  $2.5 \times 10^{-6}$ . The concentration of  $\text{OH}^-$  in the sweat is \_\_\_\_\_, and this solution is \_\_\_\_\_ (acidic, basic, neutral).

Answer: <https://biology-forums.com/index.php?topic=290806>

### Question 1025

At STP if 1.00 mole of gas occupies 22.4 L then 0.200 mole of gas would occupy \_\_\_\_\_ L under the same conditions.

Answer: <https://biology-forums.com/index.php?topic=290053>

### Question 1026

Which of the following elements exhibits the most metallic character?

- A) Ga
- B) Ge
- C) C
- D) S

Answer: <https://biology-forums.com/index.php?topic=291849>

### Question 1027

Write the chemical formula for aquabromobis(ethylenediamine)chromium(III) chloride.

- A)  $[\text{CrBr}(\text{H}_2\text{O})(\text{en})]\text{Cl}$
- B)  $[\text{CrBr}_2(\text{H}_2\text{O})(\text{en})]\text{Cl}_2$
- C)  $[\text{CrBr}(\text{H}_2\text{O})(\text{en})_2]\text{Cl}_2$
- D)  $[\text{CrBr}(\text{H}_2\text{O})(\text{en})_2]\text{Cl}_3$

Answer: <https://biology-forums.com/index.php?topic=291510>

### Question 1028

When pressure-volume measurements are made on 1.0 mol of gas at constant temperature, a plot V versus P results in a

- A) hyperbola.
- B) parabola.
- C) sine curve.
- D) straight line.

Answer: <https://biology-forums.com/index.php?topic=289922>

### Question 1029

What is the oxidation number of mercury in cinnabar?

Answer: <https://biology-forums.com/index.php?topic=291683>

### Question 1030

A gas occupies 22.4 L at STP and 16.5 L at 100°C and 1.75 atm pressure. How many moles of gas did the system gain or lose?

- A) 0.06 moles gained
- B) 0.03 moles gained
- C) 0.03 moles lost
- D) 0.06 moles lost

Answer: <https://biology-forums.com/index.php?topic=290005>

### Question 1031

An old copper penny has a mass  $3 \times 10^{22}$  times that of a copper atom. Compare the de Broglie wavelength of a penny moving at 0.5 m/s to that of a copper atom moving 104 times as fast. The wavelength for the

- A) copper atom is  $3 \times 10^{18}$  times that of the penny.
- B) copper atom is  $3 \times 10^{26}$  times that of the penny.
- C) penny is  $3 \times 10^{18}$  times that of the copper atom.
- D) penny is  $3 \times 10^{26}$  times that of the copper atom.

Answer: <https://biology-forums.com/index.php?topic=289375>

### Question 1032

Steel is a mixture composed primarily of

- A) iron and chromium.
- B) iron and zinc.
- C) iron and lead.
- D) iron and gold.

Answer: <https://biology-forums.com/index.php?topic=291671>

### Question 1033

The heat of vaporization of water at 100°C is 40.66 kJ/mol. Calculate the quantity of heat that is absorbed/released when 7.00 g of steam condenses to liquid water at 100°C.

- A) 15.8 kJ of heat are absorbed.
- B) 15.8 kJ of heat are released.

C) 105 kJ of heat are absorbed.

D) 105 kJ of heat are released.

Answer: <https://biology-forums.com/index.php?topic=289861>

### Question 1034

Cyanogen is a gas which contains 46.2% C and 53.8% N by mass. At a temperature of 25°C and a pressure of 750 mm Hg, 1.50 g of cyanogen occupies 0.714 L. What is the molecular formula of cyanogen?

A) CN

B) C<sub>2</sub>N<sub>2</sub>

C) C<sub>3</sub>N<sub>4</sub>

D) C<sub>4</sub>N<sub>5</sub>

Answer: <https://biology-forums.com/index.php?topic=289944>

### Question 1035

At a given temperature the vapor pressures of benzene and toluene are 183 mm Hg and 59.2 mm Hg, respectively. Calculate the total vapor pressure over a solution of benzene and toluene with  $X_{\text{benzene}} = 0.400$ .

A) 110 mm Hg

B) 133 mm Hg

C) 109 mm Hg

D) 242 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290242>

### Question 1036

Based on the variation in  $Z_{\text{eff}}$ , which  $M^{2+}$  ion should be the strongest reducing agent?

A) Ti

B) Cr

C) Fe

D) Zn

Answer: <https://biology-forums.com/index.php?topic=291531>

### Question 1037

Which of the following statements about cis-trans isomers is not correct?

A) Conversion between cis- and trans-isomers occurs easily by rotation around the double bond.

B) In the trans- isomer, the groups of interest are on opposite sides across the double bond.

C) In the cis- isomer, the groups of interest are on the same side of the double bond.

D) There are no cis-trans isomers in alkynes.

Answer: <https://biology-forums.com/index.php?topic=291958>

### Question 1038

What is the value of the equilibrium constant,  $K$  for a redox reaction involving the transfer of 6 mol of electrons if its standard potential is 0.043?

A)  $4.384 \times 10^5$

B)  $2.28 \times 10^4$

C) 1.70

D)  $5.90 \times 10^{-1}$

Answer: <https://biology-forums.com/index.php?topic=291235>

### Question 1039

Based on the variation in  $Z_{\text{eff}}$ , which oxoanion should be the strongest oxidizing agent?

A)  $\text{VO}_4^{3-}$

B)  $\text{CrO}_4^{2-}$

C)  $\text{MnO}_4^{2-}$

D)  $\text{FeO}_4^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291533>

### Question 1040

The compound,  $\text{ClO}$ , is named

A) chlorite.

B) hypochlorite.

C) chlorine monoxide.

D) chlorine (II) oxide.

Answer: <https://biology-forums.com/index.php?topic=289017>

### Question 1041

The atoms of a particular element all have the same number of protons as neutrons. Which of the following must be true?

- A) The atomic weight must be a whole number.
- B) The mass number for each atom must equal the atomic weight of the element.
- C) The mass number must be exactly twice the atomic number for each atom.
- D) All of these are true.

Answer: <https://biology-forums.com/index.php?topic=288900>

### Question 1042

When the temperature of a gas whose activation energy is 55 kJ/mol is increased from 300 K to 320 K, the fraction of collisions with sufficient energy to react

- A) decreases by a factor of 2.
- B) decreases by a factor of 4.
- C) increases by a factor of 2.
- D) increases by a factor of 4.

Answer: <https://biology-forums.com/index.php?topic=290392>

### Question 1043

Potassium hydrogen phthalate (molar mass = 204.2 g/mol) is one of the most commonly used acids for standardizing solutions containing bases. KHP is a monoprotic weak acid with  $K_a = 1.0 \times 10^{-5}$ . Calculate the pH of the solution that results when 0.40 g of KHP is dissolved in enough water to produce 25.0 mL of solution.

- A) 2.10
- B) 3.26
- C) 4.30
- D) 5.41

Answer: <https://biology-forums.com/index.php?topic=290773>

### Question 1044

$K_p = 1.5 \times 10^3$  at 400°C for the reaction  $2 \text{NH}_3(\text{g}) \rightleftharpoons \text{N}_2(\text{g}) + 3 \text{H}_2(\text{g})$ . What is the value of  $K_p$  for the reaction:

$2 \text{N}_2(\text{g}) + 6 \text{H}_2(\text{g}) \rightleftharpoons 4 \text{NH}_3(\text{g})$ ?

- A)  $4.4 \times 10^{-7}$
- B)  $3.3 \times 10^{-4}$
- C)  $6.7 \times 10^{-4}$
- D)  $2.3 \times 10^6$

Answer: <https://biology-forums.com/index.php?topic=290502>

### Question 1045

Which ion has the largest radius?

$\text{Ca}^{2+}$ ,  $\text{Ca}^{+1}$ ,  $\text{Br}^-$ ,  $\text{K}^+$

- A)  $\text{Ca}^{2+}$
- B)  $\text{Ca}^{+1}$
- C)  $\text{Br}^-$
- D)  $\text{K}^+$

Answer: <https://biology-forums.com/index.php?topic=289483>

### Question 1046

What is the molar mass of aspartic acid,  $\text{C}_4\text{O}_4\text{H}_7\text{N}$ ?

- A) 43 g/mol
- B) 70 g/mol
- C) 133 g/mol
- D) 197 g/mol

Answer: <https://biology-forums.com/index.php?topic=289077>

### Question 1047

How many electrons are in a neutral atom of iodine-131?

- A) 1
- B) 53
- C) 54

D) 131

Answer: <https://biology-forums.com/index.php?topic=288976>

### Question 1048

Which of the three laws of thermodynamics states the criterion for spontaneity?

- A) the first law of thermodynamics
- B) the second law of thermodynamics
- C) the third law of thermodynamics
- D) both the second and third laws of thermodynamics

Answer: <https://biology-forums.com/index.php?topic=291040>

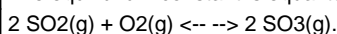
### Question 1049

The ion  $Q^{2+}$  contains 36 electrons. The identity of element Q is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289571>

### Question 1050

The equilibrium constant is equal to 5.00 at 1300 K for the reaction:



If initial concentrations are  $[\text{SO}_2] = 1.20 \text{ M}$ ,  $[\text{O}_2] = 0.45 \text{ M}$ , and  $[\text{SO}_3] = 1.80 \text{ M}$ , the system is

- A) at equilibrium.
- B) not at equilibrium and will remain in an unequilibrated state.
- C) not at equilibrium and will shift to the left to achieve an equilibrium state.
- D) not at equilibrium and will shift to the right to achieve an equilibrium state.

Answer: <https://biology-forums.com/index.php?topic=290520>

### Question 1051

A 1.75 L container filled with  $\text{CO}_2$  gas at  $25^\circ\text{C}$  and 225 kPa pressure springs a leak. When the container is re-sealed, the pressure is 200 kPa and the temperature is  $10^\circ\text{C}$ . How many moles of gas were lost?

- A) 0.0101 mol
- B) 0.149 mol
- C) 6.71 mol
- D) 99.0 mol

Answer: <https://biology-forums.com/index.php?topic=289936>

### Question 1052

The molecules  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$  and  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}=\text{CH}_2$ , respectively, belong to the \_\_\_\_\_ family and the \_\_\_\_\_ family of organic molecules.

Answer: <https://biology-forums.com/index.php?topic=292059>

### Question 1053

Which of the following is true? The probability density

- A) for all s orbitals is independent of direction from the nucleus.
- B) for all s orbitals is independent of distance from the nucleus.
- C) is independent of direction from the nucleus for 1s orbitals only.
- D) is independent of distance from the nucleus for 1s orbitals only.

Answer: <https://biology-forums.com/index.php?topic=289395>

### Question 1054

Dinitrogen monoxide gas decomposes to form nitrogen gas and oxygen gas. How many grams of nitrogen are formed when 5.54 g of dinitrogen monoxide decomposes?

- A) 4.35
- B) 17.41
- C) 3.53
- D) 7.06

Answer: <https://biology-forums.com/index.php?topic=289154>

### Question 1055

What is the molality of a glucose solution prepared by dissolving 9.00 g of glucose,  $\text{C}_6\text{H}_{12}\text{O}_6$ , in 125.9 g of water?

- A)  $2.38 \times 10^{-4} \text{ m}$



- B) 0.0715 m
- C) 0.347 m
- D) 0.397 m

Answer: <https://biology-forums.com/index.php?topic=290223>

### Question 1056

Elements A and Q form two compounds, AQ and A<sub>2</sub>Q<sub>3</sub>. The mass ratio (mass Q)/(mass A) for AQ is 0.574. What is the mass ratio (mass Q)/(mass A) for A<sub>2</sub>Q<sub>3</sub>?

- A) 0.383
- B) 0.861
- C) 1.16
- D) 2.61

Answer: <https://biology-forums.com/index.php?topic=288886>

### Question 1057

What percentage of a radioactive substance remains after 6.00 half-lives have elapsed?

- A) 0.78%
- B) 1.56%
- C) 3.31%
- D) 6.25%

Answer: <https://biology-forums.com/index.php?topic=291358>

### Question 1058

Using the conjugate acid-base pairs listed below, complete the following equation with the pair that gives an equilibrium constant  $K_c > 1$ .

\_\_\_\_\_ + H<sub>2</sub>CO<sub>3</sub>  $\rightleftharpoons$  \_\_\_\_\_ + HCO<sub>3</sub><sup>-</sup>

- A) HF/F<sup>-</sup>
- B) HCl/Cl<sup>-</sup>
- C) HOCl/OCl<sup>-</sup>
- D) HSO<sub>4</sub><sup>2-</sup>/SO<sub>4</sub><sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=290643>

### Question 1059

What is the general trend in ionization energy and electron affinity values?

- A) Both decrease as one traverses a period from left to right and both decrease as one descends a group.
- B) Both decrease as one traverses a period from left to right and both increase as one descends a group.
- C) Both increase as one traverses a period from left to right and both decrease as one descends a group.
- D) Both increase as one traverses a period from left to right and both increase as one descends a group.

Answer: <https://biology-forums.com/index.php?topic=289506>

### Question 1060

Which ligand when bonded to a metal would be incorrectly named?

- A) H<sub>2</sub>O, aqua
- B) NH<sub>3</sub>, carbonyl
- C) CO, carbonyl
- D) I<sup>-</sup>, iodo

Answer: <https://biology-forums.com/index.php?topic=291570>

### Question 1061

If niobium loses all of its valence electrons when it reacts with fluorine, what is the formula of the neutral binary compound that results?

Answer: <https://biology-forums.com/index.php?topic=291931>

### Question 1062

Peptide bonds that link amino acids together in proteins contain the \_\_\_\_\_ functional group.

- A) amine
- B) amide
- C) ester
- D) ketone

Answer: <https://biology-forums.com/index.php?topic=291977>

### Question 1063

Which transition metal has the anomalous ground-state electron configuration: [Kr] 4d<sup>10</sup>?

- A) Rh
- B) Pd
- C) Ag
- D) Cd

Answer: <https://biology-forums.com/index.php?topic=291483>

### Question 1064

Of the following, which element has the highest first ionization energy?

- A) iodine
- B) bromine
- C) fluorine
- D) chlorine

Answer: <https://biology-forums.com/index.php?topic=289485>

### Question 1065

Which is not a hydrate of a proton?

- A) H<sub>3</sub>O<sup>+</sup>
- B) H<sub>7</sub>O<sup>+</sup>
- C) H<sub>9</sub>O<sup>+</sup>
- D) H<sub>21</sub>O<sup>+</sup>

Answer: <https://biology-forums.com/index.php?topic=290742>

### Question 1066

What is the concentration of FeBr<sub>3</sub> in a solution prepared by dissolving 10.0 g of FeBr<sub>3</sub> in enough water to make 275 mL of solution?

- A) 1.23 × 10<sup>-4</sup> M
- B) 0.123 M
- C) 1.23 M
- D) 1.23 × 10<sup>3</sup> M

Answer: <https://biology-forums.com/index.php?topic=289206>

### Question 1067

The acids HNO<sub>3</sub> and HNO<sub>2</sub> are named \_\_\_\_\_ and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=289350>

### Question 1068

Which one of the following is not considered to be a Lewis base?

- A) H<sub>2</sub>S
- B) NH<sub>3</sub>
- C) NH<sub>4</sub><sup>+</sup>
- D) Cl<sup>-</sup>

Answer: <https://biology-forums.com/index.php?topic=290798>

### Question 1069

Which one of the following is an electrical insulator?

- A) alumina
- B) germanium doped with antimony
- C) gold
- D) tellurium

Answer: <https://biology-forums.com/index.php?topic=291676>

### Question 1070

What is the pH of a solution prepared by mixing 100.00 mL of 0.020 M Ca(OH)<sub>2</sub> with 50.00 mL of 0.200 M NaOH? Assume that the volumes are additive.

- A) 12.90
- B) 12.97
- C) 13.15

D) 13.45

Answer: <https://biology-forums.com/index.php?topic=290768>

### Question 1071

The nuclear transformation potassium-40 argon-40 + ? is classified as

- A) alpha emission.
- B) beta emission.
- C) electron capture.
- D) positron emission.

Answer: <https://biology-forums.com/index.php?topic=291337>

### Question 1072

A reactive element with a relatively high electronegativity would be expected to have a relatively

- A) small negative electron affinity and a relatively low ionization energy.
- B) small negative electron affinity and a relatively high ionization energy.
- C) large negative electron affinity and a relatively low ionization energy.
- D) large negative electron affinity and a relatively high ionization energy.

Answer: <https://biology-forums.com/index.php?topic=289593>

### Question 1073

According to the third law of thermodynamics,

- A) energy is conserved in any transformation of matter.
- B) the entropy increases for any spontaneous process.
- C) the entropy of a perfectly ordered, crystalline substance is zero at 0 Kelvin.
- D) the entropy of the universe increases for any spontaneous process.

Answer: <https://biology-forums.com/index.php?topic=290974>

### Question 1074

For a system at constant pressure, 19,400 calories of heat are released. This quantity of heat is equivalent to

- A)  $6.92 \times 10^{-5}$  J.
- B)  $8.12 \times 10^3$  J.
- C)  $1.94 \times 10^4$  J.
- D)  $8.12 \times 10^4$  J.

Answer: <https://biology-forums.com/index.php?topic=289845>

### Question 1075

Which of the following statements concerning the electrorefining of copper is not true?

- A) The anode is constructed of chalcocite,  $\text{Cu}_2\text{S}$ .
- B) The anode mud is a valuable source of silver, gold, and platinum.
- C) Copper is oxidized at the anode and copper(II) ions are reduced at the cathode.
- D) The process is used to purify copper.

Answer: <https://biology-forums.com/index.php?topic=291168>

### Question 1076

Is a hydroelectric dam a form of kinetic or potential molecular energy?

Answer: <https://biology-forums.com/index.php?topic=289892>

### Question 1077

What is the pH of a solution prepared by mixing 50.00 mL of 0.10 M  $\text{NH}_3$  with 25.00 mL of 0.10 M  $\text{NH}_4\text{Cl}$ ? Assume that the volume of the solutions are additive and that  $K_b = 1.8 \times 10^{-5}$  for  $\text{NH}_3$ .

- A) 8.95
- B) 9.26
- C) 9.56
- D) 11.13

Answer: <https://biology-forums.com/index.php?topic=290830>

### Question 1078

The subshell designations follow the alphabet after f. What is the first shell in which an h orbital would be allowed?

- A) fifth

- B) sixth
- C) seventh
- D) eighth

Answer: <https://biology-forums.com/index.php?topic=289386>

### Question 1079

The chemical formula for rubidium peroxide is

- A) RbOH.
- B) RbO<sub>2</sub>.
- C) Rb<sub>2</sub>O.
- D) Rb<sub>2</sub>O<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=289015>

### Question 1080

How is slag separated from molten ore in a blast furnace?

- A) chemical treatment
- B) density differences
- C) distillation
- D) magnetic differences

Answer: <https://biology-forums.com/index.php?topic=291603>

### Question 1081

What is the strongest acid among the following?

- A) HF
- B) HCl
- C) H<sub>2</sub>O
- D) H<sub>2</sub>S

Answer: <https://biology-forums.com/index.php?topic=290743>

### Question 1082

Compared to ultraviolet radiation, infrared radiation occurs at \_\_\_\_\_ wavelengths, \_\_\_\_\_ frequencies, and \_\_\_\_\_ energies.

Answer: <https://biology-forums.com/index.php?topic=289452>

### Question 1083

Which element is likely to be a principal impurity in zinc ore?

- A) lead
- B) zinc
- C) silver
- D) cadmium

Answer: <https://biology-forums.com/index.php?topic=291669>

### Question 1084

Which element of group 4A has the greatest electronegativity?

- A) C
- B) Si
- C) Ge
- D) Sn

Answer: <https://biology-forums.com/index.php?topic=291752>

### Question 1085

Predict whether removing two electrons from F<sub>2</sub> will create an ion that is diamagnetic or paramagnetic and have an F—F that is stronger or weaker than the bond in F<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=289774>

### Question 1086

An orbital that has the appearance of a three-dimensional clover leaf has a quantum number  $l =$  \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289467>

### Question 1087

\_\_\_\_\_ refers to how well a number of independent measurements agree with one another, whereas \_\_\_\_\_ refers to how close to the true value a given measurement is.

Answer: <https://biology-forums.com/index.php?topic=288857>

### Question 1088

What is the resulting pH when 0.005 moles of KOH is added to 0.100 L of a buffer solution that is 0.100 M in  $\text{H}_2\text{PO}_4^-$  and 0.100 M  $\text{HPO}_4^{2-}$  and the  $K_{a2} = 6.2 \times 10^{-8}$ ?

- A) 5.21
- B) 5.61
- C) 6.73
- D) 7.69

Answer: <https://biology-forums.com/index.php?topic=290842>

### Question 1089

The energy of an electron in a multielectron atom depends on the quantum numbers \_\_\_\_\_ and \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289460>

### Question 1090

How many geometrical and structural isomers are there of butene?

- A) 3
- B) 4
- C) 5
- D) 6

Answer: <https://biology-forums.com/index.php?topic=291945>

### Question 1091

The number of waters of hydration in the hydrate  $\text{H}_2\text{SO}_4 \cdot n\text{H}_2\text{O}$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290804>

### Question 1092

The most stable allotrope of sulfur is  $\text{S}_8$ . What are the approximate bond angles in  $\text{S}_8$ ?

Answer: <https://biology-forums.com/index.php?topic=291929>

### Question 1093

A positron is

- A) n.
- B) p.
- C) e.
- D)  $\bar{e}$ .

Answer: <https://biology-forums.com/index.php?topic=291427>

### Question 1094

The decomposition of ammonia is:  $2\text{NH}_3(\text{g}) \rightleftharpoons \text{N}_2(\text{g}) + 3\text{H}_2(\text{g})$ . If the pressure of ammonia is  $1.0 \times 10^{-3}$  atm, and the pressures of  $\text{N}_2$  and  $\text{H}_2$  are each 0.20 atm, what is the value for  $K_p$  at  $400^\circ\text{C}$  for the reverse reaction?

- A)  $-6.2 \times 10^{-4}$
- B)  $-1.6 \times 10^3$
- C)  $6.2 \times 10^{-4}$
- D)  $1.6 \times 10^3$

Answer: <https://biology-forums.com/index.php?topic=290509>

### Question 1095

A reaction has the rate law  $\text{Rate} = k[\text{NO}]^2[\text{H}_2]$ . If the concentration of NO is reduced by 1/3, the rate of reaction will be \_\_\_\_\_ (increased, decreased) by \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290465>

### Question 1096

Three identical flasks contain three different gases at standard temperature and pressure. Flask A contains  $\text{O}_2$ , flask B contains  $\text{SO}_2$ , and flask C contains He. Which flask contains the largest number of molecules?

- A) flask A

- B) flask B  
C) flask C  
D) All contain same number of molecules.

Answer: <https://biology-forums.com/index.php?topic=289999>

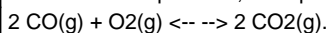
### Question 1097

Does tyrosine contain an aromatic ring?

Answer: <https://biology-forums.com/index.php?topic=292065>

### Question 1098

At a certain temperature,  $K_c$  equals  $1.4 \times 10^2$  for the reaction:



If a 2.50-L flask contains 0.400 mol of  $\text{CO}_2$  and 0.100 mol of  $\text{O}_2$  at equilibrium, how many moles of  $\text{CO}$  are also present in the flask?

- A) 0.422 mol  
B) 0.169 mol  
C) 0.107 mol  
D) 0.0114 mol

Answer: <https://biology-forums.com/index.php?topic=290525>

### Question 1099

Energy can be classified as either \_\_\_\_\_ energy (energy of motion) or \_\_\_\_\_ energy (stored energy).

Answer: <https://biology-forums.com/index.php?topic=289887>

### Question 1100

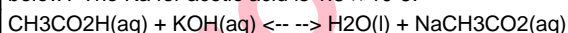
The wavelength of light used to observe an object must be \_\_\_\_\_ than the object itself.

- A) larger  
B) smaller  
C) of higher energy  
D) of lower energy

Answer: <https://biology-forums.com/index.php?topic=290097>

### Question 1101

What is the approximate value of the equilibrium constant,  $K_n$ , for the neutralization of acetic acid with potassium hydroxide, shown in the equation below? The  $K_a$  for acetic acid is  $1.8 \times 10^{-5}$ .



- A)  $1.8 \times 10^{-19}$   
B)  $5.6 \times 10^{-10}$   
C)  $1.8 \times 10^{-8}$   
D)  $1.8 \times 10^9$

Answer: <https://biology-forums.com/index.php?topic=290888>

### Question 1102

What is the decay constant for a radioactive isotope which decreases to 34% of its original value in 2.48 hours?

- A) 0.137  $\text{hr}^{-1}$   
B) 0.168  $\text{hr}^{-1}$   
C) 0.435  $\text{hr}^{-1}$   
D) 2.30  $\text{hr}^{-1}$

Answer: <https://biology-forums.com/index.php?topic=291361>

### Question 1103

Which of the following is not a state function?

- A) depth  
B) heat  
C) internal energy  
D) gas

Answer: <https://biology-forums.com/index.php?topic=289848>

### Question 1104

The short hand electron configuration of iron in  $[\text{FeF}_6]^{3-}$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291585>

### Question 1105

When more than 3000 known nuclides are plotted on a neutron/proton grid, they make up a group called

- A) the "island of stability."
- B) the "band of nuclear stability."
- C) the "sea of instability."
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=291432>

### Question 1106

The mass of a helium-4 nucleus is \_\_\_\_\_ (greater than, less than, the same as) the sum of the masses of two protons plus two neutrons.

Answer: <https://biology-forums.com/index.php?topic=291464>

### Question 1107

What is the empirical formula of a substance that contains 2.64 g of C, 0.444 g of H, and 3.52 g of O?

- A) CH<sub>2</sub>O
- B) C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>
- C) C<sub>2</sub>H<sub>4</sub>O<sub>3</sub>
- D) C<sub>3</sub>H<sub>4</sub>O<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289178>

### Question 1108

Identify the compound that is an ester.

- A) propyl propanoate
- B) 3-hexanone
- C) ethanoic acid
- D) dimethyl ether

Answer: <https://biology-forums.com/index.php?topic=291994>

### Question 1109

What is the most acidic oxide of phosphorus?

- A) PO<sub>2</sub>
- B) PO<sub>3</sub>
- C) P<sub>4</sub>O<sub>6</sub>
- D) P<sub>4</sub>O<sub>10</sub>

Answer: <https://biology-forums.com/index.php?topic=291796>

### Question 1110

Galvanized steel is steel coated with a layer of

- A) Fe<sub>2</sub>O<sub>3</sub>.
- B) Ag.
- C) Pb.
- D) Zn.

Answer: <https://biology-forums.com/index.php?topic=291238>

### Question 1111

Which of the following must be true in order for this reaction to always proceed spontaneously?

- A)  $K = Q$
- B)  $K > Q$
- C)  $K < Q$
- D) None of these, spontaneity is dependent on reaction conditions.

Answer: <https://biology-forums.com/index.php?topic=291019>

### Question 1112

What is the ground state valence shell electron configuration of a group 4A element?

- A) ns<sup>0</sup> np<sup>4</sup>
- B) ns<sup>1</sup> np<sup>3</sup>
- C) ns<sup>2</sup> np<sup>2</sup>

D) ns2 np4

Answer: <https://biology-forums.com/index.php?topic=291749>

### Question 1113

Kinetic energy increases with increasing \_\_\_\_\_ and increasing \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289888>

### Question 1114

A solution of 62.4 g of insulin in enough water to make 1.000 L of solution has an osmotic pressure of 0.305 atm at 25°C. Based on these data, what is the molar mass of insulin?

- A) 621 g/mol
- B) 5000 g/mol
- C) 7570 g/mol
- D) 71,900 g/mol

Answer: <https://biology-forums.com/index.php?topic=290263>

### Question 1115

Which one of the following gases will have the highest rate of effusion?

- A) HCN
- B) CO<sub>2</sub>
- C) Ar
- D) SO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290042>

### Question 1116

In the galvanic cell represented by the shorthand notation below, electrons are lost by \_\_\_\_\_ and gained by \_\_\_\_\_.

Pt(s)|Sn<sup>2+</sup>(aq)|Sn<sup>4+</sup>(aq)||Br<sub>2</sub>(l)|Br<sup>-</sup>(aq)|Pt(s)

Answer: <https://biology-forums.com/index.php?topic=291277>

### Question 1117

Which one of the following would be expected to have the lowest standard molar entropy, S°, at 25°C?

- A) C H<sub>4</sub>(g)
- B) C<sub>3</sub>H<sub>6</sub>(g)
- C) C<sub>3</sub>H<sub>8</sub>(g)
- D) C<sub>4</sub> H<sub>10</sub>OH(g)

Answer: <https://biology-forums.com/index.php?topic=291035>

### Question 1118

Approximately what mass percent of a body's dry weight consists of proteins?

- A) 5%
- B) 40%
- C) 50%
- D) 70%

Answer: <https://biology-forums.com/index.php?topic=292029>

### Question 1119

In which compound is the oxidation state of oxygen not -2?

- A) MgO
- B) Na<sub>2</sub>O
- C) K<sub>2</sub>O<sub>2</sub>
- D) Al<sub>2</sub>O<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=289324>

### Question 1120

Which element of group 6A has the highest boiling point?

- A) Al
- B) O
- C) Po
- D) As



Answer: <https://biology-forums.com/index.php?topic=291894>

### Question 1121

What element was found to be the first superconductor of electricity at 4.2 K in 1911?

- A) nickel
- B) aluminum
- C) gallium
- D) mercury

Answer: <https://biology-forums.com/index.php?topic=291679>

### Question 1122

What is the pH of a solution prepared by mixing 50.00 mL of 0.10 M methylamine,  $\text{CH}_3\text{NH}_2$ , with 15.00 mL of 0.10 M methylammonium chloride,  $\text{CH}_3\text{NH}_3\text{Cl}$ ? Assume that the volume of the solutions are additive and that  $K_b = 3.70 \times 10^{-4}$  for methylamine.

- A) 10.04
- B) 10.57
- C) 11.09
- D) 11.78

Answer: <https://biology-forums.com/index.php?topic=290896>

### Question 1123

One liter is approximately the same as one U.S.

- A) ounce.
- B) pint.
- C) quart.
- D) gallon.

Answer: <https://biology-forums.com/index.php?topic=288754>

### Question 1124

In a solution that is 75% ethyl alcohol and 25% water, the solute is \_\_\_\_\_ and the solvent is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290323>

### Question 1125

Which one of the following elements forms the most acidic binary oxide?

- A) Ne
- B) Cu
- C) N
- D) Li

Answer: <https://biology-forums.com/index.php?topic=291890>

### Question 1126

At a given temperature the vapor pressures of benzene and toluene are 183 mm Hg and 59.2 mm Hg, respectively. Calculate the mole fraction of benzene in the vapor phase over a solution of benzene and toluene with  $X_{\text{benzene}} = 0.600$ .

- A) 0.600
- B) 0.678
- C) 0.756
- D) 0.823

Answer: <https://biology-forums.com/index.php?topic=290243>

### Question 1127

The standard cell potential for the following galvanic cell is 1.21 V.



When  $[\text{Al}^{3+}] = 0.10 \text{ M}$  and  $[\text{Fe}^{2+}] = 0.10 \text{ M}$ , will the cell potential at 25°C be less than, the same as, or greater than 1.21 V?

Answer: <https://biology-forums.com/index.php?topic=291307>

### Question 1128

Which of the following statements is false regarding the equilibrium constant,  $K_c$ ?

- A)  $K_c$  for a reaction at a particular temperature always has the same value.
- B)  $K_c$  for the reverse reaction is the negative of  $K_c$  for the forward reaction.
- C) The numerical value of  $K_c$  depends on the form of the balanced equation.

D) When quoting Kc it is customary to omit units.

Answer: <https://biology-forums.com/index.php?topic=290486>

### Question 1129

Which first row transition element has the highest melting point?

- A) Sc
- B) V
- C) Fe
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291555>

### Question 1130

What is the freezing point of a solution of 8.00 g MgCl<sub>2</sub> in 100 g of water? K<sub>f</sub> for water is 1.86°C/m for water.

- A) 1.56°C
- B) -1.56°C
- C) 4.69°C
- D) -4.69°C

Answer: <https://biology-forums.com/index.php?topic=290249>

### Question 1131

Entropy is a measure of

- A) free energy.
- B) the heat of a reaction.
- C) molecular randomness.
- D) the rate of a reaction.

Answer: <https://biology-forums.com/index.php?topic=290959>

### Question 1132

The total binding energies for <sup>3</sup>He, <sup>4</sup>He, and <sup>6</sup>He are 7.72 MeV, 28.29 MeV, and 29.26 MeV respectively. Arrange the 3 isotopes in increasing order of binding energy per nucleon.

- A) <sup>3</sup>He < <sup>4</sup>He < <sup>6</sup>He
- B) <sup>6</sup>He < <sup>4</sup>He < <sup>3</sup>He
- C) <sup>4</sup>He < <sup>3</sup>He < <sup>6</sup>He
- D) <sup>3</sup>He < <sup>6</sup>He < <sup>4</sup>He

Answer: <https://biology-forums.com/index.php?topic=291368>

### Question 1133

Within a given shell of a multielectron atom, the lower l for an orbital, the

- A) higher the orbital energy and the higher Z<sub>eff</sub> for the electron.
- B) higher the orbital energy and the lower Z<sub>eff</sub> for the electron.
- C) lower the orbital energy and the higher Z<sub>eff</sub> for the electron.
- D) lower the orbital energy and the lower Z<sub>eff</sub> for the electron.

Answer: <https://biology-forums.com/index.php?topic=289398>

### Question 1134

What is the oxidation number of the chromium atom in Li<sub>2</sub>Cr<sub>2</sub>O<sub>4</sub>?

- A) -2
- B) +2
- C) +6
- D) +7

Answer: <https://biology-forums.com/index.php?topic=289321>

### Question 1135

Calculate the mass defect for the formation of phosphorus-31. The mass of a phosphorus-31 nucleus is 30.973765 amu. The masses of a proton and a neutron are 1.00728 and 1.00866 amu, respectively.

- A) 0.13015 amu
- B) 0.15404 amu
- C) 0.27261 amu
- D) 0.27399 amu

Answer: <https://biology-forums.com/index.php?topic=291369>

### Question 1136

Assume that the vapor at point c is condensed and reboiled. What is the vapor composition during reboiling?

- A) 100% decane
- B) composition at point b
- C) composition at point c
- D) composition at point e

Answer: <https://biology-forums.com/index.php?topic=290267>

### Question 1137

What is the bond order of the O—O bond in O<sub>2</sub>?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289587>

### Question 1138

What is the second stepwise equilibrium constant expression for phosphoric acid H<sub>3</sub>PO<sub>4</sub>?

- A)  $K_{a2} = \frac{[H_3O^+][H_2PO_4^-]}{[H_3PO_4]}$
- B)  $K_{a2} = \frac{[H_3O^+]^2[HPO_4^{2-}]}{[H_3PO_4]}$
- C)  $K_{a2} = \frac{[H_3O^+]^3[PO_4^{3-}]}{[H_3PO_4]}$
- D)  $K_{a2} = \frac{[H_3O^+][HPO_4^{2-}]}{[H_2PO_4^-]}$

Answer: <https://biology-forums.com/index.php?topic=290696>

### Question 1139

Which of the following combinations of chemicals could be used to make a buffer solution?

- A) HCl/KOH
- B) HCl/NH<sub>3</sub>
- C) HBr/H<sub>3</sub>PO<sub>4</sub>
- D) KOH/NH<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290903>

### Question 1140

A property that depends on the amount of a substance is an \_\_\_\_\_ property, whereas a property that is independent on the amount of substance is an \_\_\_\_\_ property.

Answer: <https://biology-forums.com/index.php?topic=289044>

### Question 1141

How many double and single bonds are in the resonance form for SO<sub>2</sub> in which the formal charges on each atom are zero?

- A) two single bonds and no double bonds
- B) one single bond and one double bond
- C) no single bonds and two double bonds
- D) Each of these is possible.

Answer: <https://biology-forums.com/index.php?topic=289620>

### Question 1142

When 0.500 g of vitamin K is dissolved in 10.0 g of camphor ( $K_f = 40.0^\circ\text{C}/\text{m}$ ), the freezing point of the solution is 4.43°C lower than that of pure camphor. Assuming vitamin K is a nonelectrolyte in camphor, calculate its molar mass.

- A) 0.451 g/mol
- B) 55.4 g/mol
- C) 451 g/mol
- D)  $3.54 \times 10^4$  g/mol

Answer: <https://biology-forums.com/index.php?topic=290254>

### Question 1143

What is the mole fraction of oxygen in a gas mixture that is 40.0% oxygen and 60.0% nitrogen by volume?

- A) 0.632
- B) 0.368

C) 0.400

D) 0.600

Answer: <https://biology-forums.com/index.php?topic=290206>

### Question 1144

Using exponential notation, there are \_\_\_\_\_ bytes of memory are contained in a 2 TB external hard drive.

Answer: <https://biology-forums.com/index.php?topic=288846>

### Question 1145

What are the products of the reaction of chlorine gas with hot aqueous sodium hydroxide?

A) Cl<sup>-</sup> and H<sub>2</sub>O

B) ClO<sub>3</sub><sup>-</sup> and H<sub>2</sub>O

C) Cl<sup>-</sup> and ClO<sub>3</sub><sup>-</sup>

D) Cl<sup>-</sup>, ClO<sub>3</sub><sup>-</sup> and H<sub>2</sub>O

Answer: <https://biology-forums.com/index.php?topic=291836>

### Question 1146

The smallest number that can be used for m or n in the Balmer-Rydberg equation is \_\_\_\_\_ and the largest number is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289456>

### Question 1147

Which has the highest Z<sub>eff</sub> for its valence electrons?

A) Na

B) Mg

C) Si

D) Cl

Answer: <https://biology-forums.com/index.php?topic=289400>

### Question 1148

Which element can form more than one kind of monatomic ion?

A) Sr

B) Al

C) Sn

D) O

Answer: <https://biology-forums.com/index.php?topic=289023>

### Question 1149

The alkali metals Li and Na are commercially produced by

A) chemical reduction of their molten salts.

B) electrolysis of their molten salts.

C) thermal decomposition of their molten metal halides.

D) thermal decomposition of their molten metal oxides.

Answer: <https://biology-forums.com/index.php?topic=291728>

### Question 1150

What nuclide is formed when U undergoes a portion of the decay series: alpha, beta, beta, alpha, alpha, alpha.

A) Ra

B) Rn

C) Th

D) Pb

Answer: <https://biology-forums.com/index.php?topic=291436>

### Question 1151

Salt solubilities can be compared by the concentration of cation formed when the salt dissolves in the general reaction:  $\text{MaXb(s)} \rightleftharpoons \text{a Mb}^+(\text{aq}) + \text{b Xa}^-(\text{aq})$ . Given the following salts and their equilibrium constants for the reaction above at 25°C, which salt is the least soluble?

A) AgCl,  $K_c = 1.8 \times 10^{-10}$

B) Ag<sub>2</sub>SO<sub>4</sub>,  $K_c = 1.2 \times 10^{-5}$

C) CaCO<sub>3</sub>,  $K_c = 2.6 \times 10^{-9}$

D) CaF<sub>2</sub>,  $K_c = 1.5 \times 10^{-10}$

Answer: <https://biology-forums.com/index.php?topic=290549>

### Question 1152

Which of the following hydrides is expected to have the highest melting point?

- A) H<sub>2</sub>S
- B) HF
- C) H<sub>2</sub>Se
- D) MgH<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=291866>

### Question 1153

How many d electrons are there in MnO<sub>4</sub><sup>-</sup>?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=291485>

### Question 1154

The strongest homonuclear single bond is

- A) H—H
- B) Ge—Ge
- C) As—As
- D) I—I

Answer: <https://biology-forums.com/index.php?topic=291859>

### Question 1155

The number of neutrons in a neutral atom of uranium-238 is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289053>

### Question 1156

The standard cell potential for the following galvanic cell is 0.71 V.

Pb(s)|Pb<sup>2+</sup>(aq)||Al<sup>3+</sup>(aq)|Al

This reaction has an equilibrium constant, K = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291309>

### Question 1157

The initial concentrations of Ag<sup>+</sup>(aq) and Cu<sup>2+</sup>(aq) are both 1.0 M. What will happen to the cell voltage if 5.0 M AgNO<sub>3</sub> is added to the compartment containing the 1.0 M Ag<sup>+</sup>(aq)? The cell voltage will

- A) decrease.
- B) increase.
- C) remain the same.
- D) can't tell from the information given

Answer: <https://biology-forums.com/index.php?topic=291185>

### Question 1158

The oxidation number of hydrogen in CaH<sub>2</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289352>

### Question 1159

When dissolved in water, which compound is generally considered to be an Arrhenius acid?

- A) CH<sub>3</sub>CO<sub>2</sub>H
- B) NaOH
- C) Na<sub>2</sub>CO<sub>3</sub>
- D) CH<sub>3</sub>CH<sub>2</sub>OH

Answer: <https://biology-forums.com/index.php?topic=290729>

### Question 1160

What is the percent dissociation of acetic acid if the solution has a pH = 4.74 and a pK<sub>a</sub> = 4.74?

- A) 100%
- B) 50%
- C) 10%
- D) 1%

Answer: <https://biology-forums.com/index.php?topic=290847>

### Question 1161

What is the strongest oxidizing agent of the following set: FeO, Fe<sub>2</sub>O<sub>3</sub>, Fe<sub>3</sub>O<sub>4</sub>, FeO<sub>4</sub><sup>2-</sup>?

- A) FeO
- B) Fe<sub>2</sub>O<sub>3</sub>
- C) Fe<sub>3</sub>O<sub>4</sub>
- D) FeO<sub>4</sub><sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=291503>

### Question 1162

The mass of a proton is  $1.67 \times 10^{-27}$  kg. What is the mass of a proton in Megagrams?

- A)  $1.67 \times 10^{-36}$  Mg
- B)  $1.67 \times 10^{-33}$  Mg
- C)  $1.67 \times 10^{-30}$  Mg
- D)  $1.67 \times 10^{-27}$  Mg

Answer: <https://biology-forums.com/index.php?topic=288793>

### Question 1163

How will the osmotic pressure of an aqueous solution change as evaporation occurs?

- A) The osmotic pressure will increase.
- B) The osmotic pressure will not change.
- C) The osmotic pressure will decrease.
- D) The osmotic pressure will increase or decrease until it equals the vapor pressure of water.

Answer: <https://biology-forums.com/index.php?topic=290259>

### Question 1164

A 55.0-L steel tank at 20.0°C contains acetylene gas, C<sub>2</sub>H<sub>2</sub>, at a pressure of 1.39 atm. Assuming ideal behavior, how many grams of acetylene are in the tank?

- A) 3.17 g
- B) 8.20 g
- C) 82.9 g
- D) 1210 g

Answer: <https://biology-forums.com/index.php?topic=290002>

### Question 1165

Historical records of greenhouse gases can be found in

- A) polar ice caps.
- B) oil from the ground.
- C) the Alps.
- D) the Dead Sea Scrolls.

Answer: <https://biology-forums.com/index.php?topic=290047>

### Question 1166

When melting S<sub>8</sub>, \_\_\_\_\_ forces must be overcome and S<sub>8</sub> is expected to have a \_\_\_\_\_ melting point than MgS.

- A) covalent bonding, higher
- B) covalent bonding, lower
- C) intermolecular, higher
- D) intermolecular, lower

Answer: <https://biology-forums.com/index.php?topic=289603>

### Question 1167

Which of the following exhibits ion-dipole forces?

- A) KBr(s)
- B) NaF(aq)
- C) Ag(s)

D) Cl<sub>2</sub>(g)

Answer: <https://biology-forums.com/index.php?topic=289746>

### Question 1168

In fusion reactions to make superheavy elements, energy is required to bring the two nuclei together and to form additional mass. How much energy must be converted into mass for the alpha bombardment of <sup>253</sup>Es to form <sup>257</sup>Md? (The isotopic masses are <sup>253</sup>Es = 253.08294 amu, <sup>4</sup>He = 4.00260 amu, <sup>257</sup>Md = 257.09558 amu.)

- A)  $3.01 \times 10^6$  kJ/mol
- B)  $9.04 \times 10^8$  kJ/mol
- C)  $3.59 \times 10^{11}$  kJ/mol
- D)  $7.21 \times 10^{11}$  kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291383>

### Question 1169

A 1.75-L container filled with CO<sub>2</sub> gas at 25°C and 225 kPa pressure springs a leak. When the container is re-sealed, the pressure is 185 kPa and the temperature is 10°C. How many moles of gas were lost?

- A) 0.0213 mol
- B) 0.463 mol
- C) 0.561 mol
- D) 2.16 mol

Answer: <https://biology-forums.com/index.php?topic=290001>

### Question 1170

Which element has the largest energy band gap?

- A) C (diamond)
- B) Si
- C) Ge
- D) Sn (white)

Answer: <https://biology-forums.com/index.php?topic=291627>

### Question 1171

A solution with a hydroxide ion concentration of  $4.15 \times 10^{-7}$  M is \_\_\_\_\_ and has a hydrogen ion concentration of \_\_\_\_\_.

- A) acidic,  $2.41 \times 10^{-7}$  M
- B) acidic,  $2.41 \times 10^{-8}$  M
- C) basic,  $2.41 \times 10^{-7}$  M
- D) basic,  $2.41 \times 10^{-8}$  M

Answer: <https://biology-forums.com/index.php?topic=290752>

### Question 1172

Which of the following elements has the least tendency to form an ion?

- A) Be
- B) H
- C) He
- D) O

Answer: <https://biology-forums.com/index.php?topic=289007>

### Question 1173

Which of the following elements has chemical properties similar to oxygen?

- A) neon
- B) hydrogen
- C) nitrogen
- D) tellurium

Answer: <https://biology-forums.com/index.php?topic=288940>

### Question 1174

According to the kinetic molecular theory of gases, the volume of the gas particles (atoms or molecules) is \_\_\_\_\_ compared to the volume of the container in which the gas particles are held.

Answer: <https://biology-forums.com/index.php?topic=290062>

### Question 1175

Which statement is true for the general rate law:  $\text{Rate} = k[A]^m[B]^n$ ?

- A) It can be written from the stoichiometry of the first step.
- B) The overall order of the reaction is equal to  $m$  times  $n$ .
- C) The values for the exponents must be determined by experiment.
- D) The exponents in the rate law must be positive integers.

Answer: <https://biology-forums.com/index.php?topic=290422>

### Question 1176

What is the chemical process most likely to be used to purify zirconium metal?

- A) distillation
- B) electrorefining
- C) reaction with carbon monoxide (a Mond process)
- D) reaction with iodine

Answer: <https://biology-forums.com/index.php?topic=291609>

### Question 1177

What geometric arrangement does the molecule have for a central atom that has five charge clouds with two lone pairs?

- A) tetrahedral
- B) octahedral
- C) T-shaped
- D) trigonal bipyramidal

Answer: <https://biology-forums.com/index.php?topic=289720>

### Question 1178

When methane,  $\text{CH}_4$ , undergoes combustion with oxygen, the usual products are carbon dioxide and water. Carbon monoxide is formed when the limiting reactant is

- A) carbon dioxide.
- B) methane.
- C) oxygen.
- D) water.

Answer: <https://biology-forums.com/index.php?topic=289101>

### Question 1179

Monosaccharides are classified as either \_\_\_\_\_ or \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292061>

### Question 1180

One mole of gas at  $25^\circ\text{C}$  has a \_\_\_\_\_ volume than one mole of gas at standard temperature.

Answer: <https://biology-forums.com/index.php?topic=290052>

### Question 1181

Based on formal charges, what is the S—O bond order in  $\text{SO}_4^{2-}$ ?

- A) 1
- B) 1.3
- C) 1.5
- D) 2

Answer: <https://biology-forums.com/index.php?topic=289621>

### Question 1182

Which substance is a monosaccharide?

- A) cellulose
- B) glucose
- C) glycogen
- D) starch

Answer: <https://biology-forums.com/index.php?topic=291957>

### Question 1183



Vinegar is a 5.0% solution by weight of acetic acid ( $\text{CH}_3\text{CO}_2\text{H}$ ) in water. Given that the pH for acetic acid is 2.41, the  $K_a = 1.8 \times 10^{-5}$  and assuming the density of vinegar to be  $1.00 \text{ g/cm}^3$ , what is the percent dissociation of acetic acid in vinegar?

- A) 0.47%
- B) 1.5%
- C) 4.0%
- D) 5.0%

Answer: <https://biology-forums.com/index.php?topic=290693>

### Question 1184

Rubidium belongs to the \_\_\_\_\_ group of the periodic table.

- A) alkali metal
- B) alkaline earth metal
- C) halogen
- D) noble gas

Answer: <https://biology-forums.com/index.php?topic=288945>

### Question 1185

If  $\text{CO}_2$  and  $\text{NH}_3$  are allowed to effuse through a porous membrane under identical conditions, the rate of effusion for  $\text{NH}_3$  will be \_\_\_\_\_ times that of  $\text{CO}_2$ .

- A) 0.39
- B) 0.62
- C) 1.6
- D) 2.6

Answer: <https://biology-forums.com/index.php?topic=289975>

### Question 1186

Which substance is commonly found in nature in an uncombined form?

- A) Fe
- B) Zn
- C) Au
- D) Li

Answer: <https://biology-forums.com/index.php?topic=291663>

### Question 1187

What functional group is commonly found in fats?

- A)  $\text{—NH}_2$
- B)  $\text{—OH}$
- C)  $\text{—C—O—C—}$
- D) O

$\text{—O—C—C—}$

Answer: <https://biology-forums.com/index.php?topic=291967>

### Question 1188

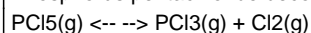
Which general rate law below corresponds to an elementary bimolecular reaction?

- A) Rate =  $k[\text{B}]$
- B) Rate =  $k[\text{A}][\text{B}][\text{C}][\text{D}]$
- C) Rate =  $k[\text{A}][\text{B}]^2$
- D) Rate =  $k[\text{A}]^2$

Answer: <https://biology-forums.com/index.php?topic=290451>

### Question 1189

Phosphorus pentachloride decomposes to phosphorus trichloride at high temperatures according to the reaction:



At  $250^\circ\text{C}$ ,  $0.250 \text{ M}$   $\text{PCl}_5$  is added to a flask. If  $K_c = 1.80$ , what are the equilibrium concentrations of each gas?

- A)  $[\text{PCl}_5] = 0.0280 \text{ M}$ ,  $[\text{PCl}_3] = 0.222 \text{ M}$ ,  $[\text{Cl}_2] = 0.222 \text{ M}$
- B)  $[\text{PCl}_5] = 1.25 \text{ M}$ ,  $[\text{PCl}_3] = 0.474 \text{ M}$ ,  $[\text{Cl}_2] = 0.474 \text{ M}$
- C)  $[\text{PCl}_5] = 1.80 \text{ M}$ ,  $[\text{PCl}_3] = 1.80 \text{ M}$ ,  $[\text{Cl}_2] = 1.80 \text{ M}$
- D)  $[\text{PCl}_5] = 2.27 \text{ M}$ ,  $[\text{PCl}_3] = 2.02 \text{ M}$ ,  $[\text{Cl}_2] = 2.02 \text{ M}$

Answer: <https://biology-forums.com/index.php?topic=290540>

### Question 1190

Ethanol has the molecular formula  $C_2H_6O$ . Which ball and stick model shown above represents ethanol? [gray spheres = C, black spheres = O, unshaded spheres = H]

- A) model a)
- B) model b)
- C) model c)
- D) model d)

Answer: <https://biology-forums.com/index.php?topic=289126>

### Question 1191

How much water must be added to 42.0 g of  $CaCl_2$  to produce a solution that is 40.0 wt%  $CaCl_2$ ?

- A) 56.7 g
- B) 63.0 g
- C) 16.8 g
- D) 120 g

Answer: <https://biology-forums.com/index.php?topic=290217>

### Question 1192

Which of the following metal hydroxides are amphoteric?

- A)  $Al(OH)_3$ ,  $Zn(OH)_2$ ,  $Cr(OH)_3$ ,  $Sn(OH)_2$
- B)  $Cu(OH)_2$ ,  $Mn(OH)_2$ ,  $Fe(OH)_2$ ,  $Fe(OH)_3$
- C)  $Be(OH)_2$ ,  $Ca(OH)_2$ ,  $Ba(OH)_2$ ,  $Sr(OH)_3$
- D)  $LiOH$ ,  $NaOH$ ,  $KOH$ ,  $RbOH$

Answer: <https://biology-forums.com/index.php?topic=290876>

### Question 1193

Carbon is the \_\_\_\_\_ most abundant element by mass in living organisms.

- A) first
- B) second
- C) third
- D) fourth

Answer: <https://biology-forums.com/index.php?topic=291764>

### Question 1194

According to the kinetic molecular theory of gases, what is the force of attraction of one CO molecule for another CO molecule?

Answer: <https://biology-forums.com/index.php?topic=290064>

### Question 1195

What is the oxidation number of the sulfur atom in  $SO_2$ ?

- A) -2
- B) +2
- C) -4
- D) +4

Answer: <https://biology-forums.com/index.php?topic=289249>

### Question 1196

The balanced net ionic equation for the neutralization reaction involving equal molar amounts of HCl and  $CH_3CH_2NH_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290934>

### Question 1197

Which of the following statements is false regarding functional groups?

- A) The chemical properties of the functional group dictate the chemistry of the larger molecule.
- B) Each functional group has a characteristic chemical behavior.
- C) A functional group consists of an atom or a group of atoms that is part of a larger molecule.
- D) A functional group consists of only carbon and hydrogen atoms.

Answer: <https://biology-forums.com/index.php?topic=291944>

### Question 1198

When sodium metal is heated in excess oxygen it tends to form

- A) an oxide.
- B) a peroxide.
- C) a superoxide.
- D) an oxide and a superoxide.

Answer: <https://biology-forums.com/index.php?topic=291808>

### Question 1199

How many mL of a 0.350 M  $\text{AlI}_3$  solution are needed to make 700. mL of a solution that is 0.350 M in  $\text{I}^-$  ion?

- A) 500 mL
- B) 167 mL
- C) 125 mL
- D) It is not possible to make a more concentrated solution from a less concentrated solution.

Answer: <https://biology-forums.com/index.php?topic=289291>

### Question 1200

How many of the following numbers contain 3 significant figures?

0.509 1.050 0.0500  $1.06 \times 10^{24}$

- A) one
- B) two
- C) three
- D) four

Answer: <https://biology-forums.com/index.php?topic=288823>

### Question 1201

A 0.35 m aqueous solution of an unknown solute has a boiling point elevation of  $0.79^\circ\text{C}$ . The boiling point elevation of a 0.35 m solution of a nonionizing molecular solute in water is  $0.33^\circ\text{C}$ . How many moles of particles are formed per mole of solute when the unknown solute is dissolved in water?

- A) 1.4
- B) 2.0
- C) 2.4
- D) 3.0

Answer: <https://biology-forums.com/index.php?topic=290319>

### Question 1202

Convert  $4.300 \times 10^{-3}$  to ordinary notation.

- A) 0.0004300
- B) 0.004300
- C) 430.0
- D) 4300

Answer: <https://biology-forums.com/index.php?topic=288790>

### Question 1203

In the protein, Asn-Phe-Cys-Lys, which amino acid contains the C-terminal group?

- A) asparagine
- B) cysteine
- C) lysine
- D) phenylalanine

Answer: <https://biology-forums.com/index.php?topic=292024>

### Question 1204

Which one of the following statements does not describe the equilibrium state?

- A) Equilibrium is dynamic and there is no net conversion to reactants and products.
- B) The concentration of the reactants is equal to the concentration of the products.
- C) The concentration of the reactants and products reach a constant level.
- D) The rate of the forward reaction is equal to the rate of the reverse reaction.

Answer: <https://biology-forums.com/index.php?topic=290484>

### Question 1205

Isoelectronic means having the same number of electrons. The dipositive ion that is isoelectronic with Br<sup>-</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289572>

### Question 1206

Which molecule contains the most easily broken carbon-carbon bond?

- A) H<sub>3</sub>C—CH<sub>3</sub>
- B) H<sub>2</sub>C=CH<sub>2</sub>
- C) F<sub>2</sub>C=CF<sub>2</sub>
- D) HC CH

Answer: <https://biology-forums.com/index.php?topic=289585>

### Question 1207

A solution with a hydrogen ion concentration of  $3.25 \times 10^{-2}$  M is \_\_\_\_\_ and has a hydroxide concentration of \_\_\_\_\_.

- A) acidic,  $3.08 \times 10^{-12}$  M
- B) acidic,  $3.08 \times 10^{-13}$  M
- C) basic,  $3.08 \times 10^{-12}$  M
- D) basic,  $3.08 \times 10^{-13}$  M

Answer: <https://biology-forums.com/index.php?topic=290653>

### Question 1208

Which is not true about elemental oxygen?

- A) Oxygen exists in two allotropic forms.
- B) Oxygen has a double bond.
- C) Oxygen is a reducing agent.
- D) Solid oxygen melts at -219 degrees Celsius.

Answer: <https://biology-forums.com/index.php?topic=291801>

### Question 1209

According to the rule of thumb "like dissolves like" ionic solids like LiF or polar substances like glucose are more soluble in \_\_\_\_\_ solvents, whereas nonpolar substances like I<sub>2</sub> are more soluble in \_\_\_\_\_ solvents.

Answer: <https://biology-forums.com/index.php?topic=290324>

### Question 1210

The formula of thallium(III) selenide contains \_\_\_\_\_ thallium(III) and \_\_\_\_\_ selenide ions.

Answer: <https://biology-forums.com/index.php?topic=289064>

### Question 1211

Which one of the following statements about balanced equations is true? A reaction is balanced by

- A) changing the charge on an ion.
- B) changing the formula of the molecule.
- C) multiplying by suitable coefficients.
- D) rearranging atoms in a molecule.

Answer: <https://biology-forums.com/index.php?topic=289070>

### Question 1212

KI does not dissolve well in nonpolar solvents because

- A) solute-solute interactions are much larger than solvent-solvent or solute-solvent interactions.
- B) solvent-solvent interactions are much larger than solute-solvent or solute-solute interactions.
- C) solute-solvent interactions are much larger than solvent-solvent or solute-solute interactions.
- D) solute-solvent interactions are similar to solvent-solvent and solute-solute interactions.

Answer: <https://biology-forums.com/index.php?topic=290270>

### Question 1213

Which one of the following compounds is insoluble in water?

- A) Na<sub>2</sub>SO<sub>4</sub>
- B) KNO<sub>3</sub>
- C) Ba SO<sub>4</sub>

D)  $\text{Li}_2\text{CO}_3$

Answer: <https://biology-forums.com/index.php?topic=289299>

### Question 1214

Which of the following amino acids contains a benzyl group?

- A) isoleucine
- B) proline
- C) asparagine
- D) tryrosine

Answer: <https://biology-forums.com/index.php?topic=292035>

### Question 1215

What is the oxidation number of oxygen in  $\text{BaO}_2$ ?

- A) 0
- B)  $-1/2$
- C) -1
- D) -2

Answer: <https://biology-forums.com/index.php?topic=291812>

### Question 1216

A catalyst increases the overall rate of reaction by lowering the activation energy,  $E_a$ , for

- A) both the forward reaction and the reverse reaction.
- B) neither the forward reaction nor the reverse reaction.
- C) only the forward reaction.
- D) only the reverse reaction.

Answer: <https://biology-forums.com/index.php?topic=290557>

### Question 1217

Chemical equations are balanced in order to obey the law of

- A) definite proportions.
- B) mass action.
- C) mass conservation.
- D) multiple proportions.

Answer: <https://biology-forums.com/index.php?topic=289068>

### Question 1218

Which element can form more than one kind of monatomic ion?

- A) Na
- B) I
- C) Cr
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=289024>

### Question 1219

What is the approximate pH of a solution X that gives the following responses with the indicators shown?

Indicators HIn — In- pH range Solution X  
methyl orange red-yellow 3.2-4.4 yellow  
methyl red red-yellow 4.8-6.0 yellow  
bromothymol blue yellow-blue 6.0-7.6 blue  
phenolphthalein colorless-pink 8.2-10.0 pink

- A) 4.8 - 6.0
- B) 6.0 - 7.6
- C) 7.6 - 8.2
- D) > 8.2

Answer: <https://biology-forums.com/index.php?topic=290670>

### Question 1220

The ratio of oxygen atoms to silicon atoms in orthosilicate, single-strand silicates, double-strand silicates, and cyclic silicates is \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=291916>

### Question 1221

Which is expected to have the strongest C—O bond?

- A) CH<sub>3</sub>OH
- B) Cl<sub>2</sub>CO
- C) CF<sub>3</sub>CO<sub>2</sub><sup>-</sup>
- D) CO<sub>3</sub><sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=289645>

### Question 1222

Which of the group 3A elements is the only one to readily form a +1 ion?

- A) B
- B) Al
- C) In
- D) Tl

Answer: <https://biology-forums.com/index.php?topic=291735>

### Question 1223

Which one of the following amino acids contains a hydrophobic side chain?

- A) alanine
- B) asparagine
- C) cysteine
- D) glutamine

Answer: <https://biology-forums.com/index.php?topic=292022>

### Question 1224

What are the names of the ions Mn<sup>2+</sup>, Sn<sup>2+</sup>, and Se<sup>2-</sup>?

- A) manganese, tin, and selenium
- B) manganese, tin(II), and selenide
- C) manganese(II), tin(II), and selenium(II-)
- D) manganous, stannous, and selenide

Answer: <https://biology-forums.com/index.php?topic=289034>

### Question 1225

Which of the following metals occurs in nature principally as oxide ores?

- A) Li
- B) Cu
- C) Cr
- D) Ru

Answer: <https://biology-forums.com/index.php?topic=291662>

### Question 1226

An Arrhenius base is best defined as a

- A) electron pair donor.
- B) hydroxide acceptor.
- C) substance that dissociates in water to produce aqueous hydrogen ions.
- D) substance that dissociates in water to produce aqueous hydroxide ions.

Answer: <https://biology-forums.com/index.php?topic=290732>

### Question 1227

Identify the following solutions as acidic, basic, or inert.

- NaNO<sub>2</sub> \_\_\_\_\_
- NaNO<sub>3</sub> \_\_\_\_\_
- C<sub>5</sub>H<sub>5</sub>NHClO<sub>4</sub> \_\_\_\_\_

Answer: <https://biology-forums.com/index.php?topic=290937>

### Question 1228

Arrange the following 0.10 M aqueous solutions in order of increasing pH:

NaOH, HBr, NaCH<sub>3</sub>CO<sub>2</sub>, KBr, NH<sub>4</sub>Br.

- A) HBr, KBr, NH<sub>4</sub>Br, NaCH<sub>3</sub>CO<sub>2</sub>, NaOH
- B) NaOH, NaCH<sub>3</sub>CO<sub>2</sub>, NH<sub>4</sub>Br, KBr, HBr
- C) NaOH, NaCH<sub>3</sub>CO<sub>2</sub>, KBr, NH<sub>4</sub>Br, HBr
- D) HBr, NH<sub>4</sub>Br, KBr, NaCH<sub>3</sub>CO<sub>2</sub>, NaOH

Answer: <https://biology-forums.com/index.php?topic=290714>

### Question 1229

The element that forms a 2+ ion with the electron configuration [Xe] 4f<sup>14</sup> 5d<sup>8</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291584>

### Question 1230

Of the following elements, which has the highest electronegativity?

- A) As
- B) Se
- C) Y
- D) Sb

Answer: <https://biology-forums.com/index.php?topic=289623>

### Question 1231

An interpretation of the results of many tests is called

- A) an experiment.
- B) a hypothesis.
- C) a prediction.
- D) a theory.

Answer: <https://biology-forums.com/index.php?topic=288731>

### Question 1232

Which of the following ionic compounds would be expected to have the highest lattice energy?

- A) RbF
- B) RbCl
- C) RbBr
- D) RbI

Answer: <https://biology-forums.com/index.php?topic=289554>

### Question 1233

A tortoise moves at a speed of 454 cm/min. How fast is the tortoise in mph?

- A) 0.17 mph
- B) 0.34 mph
- C) 17 mph
- D) 0.0017 mph

Answer: <https://biology-forums.com/index.php?topic=288781>

### Question 1234

If  $K_c = 2.0 \times 10^{33}$  at 25°C, for the following reaction:  $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons 2 \text{HCl}(\text{g})$ , then find  $K_p$  at the same temperature.

- A)  $8.2 \times 10^{31}$
- B)  $9.7 \times 10^{32}$
- C)  $2.0 \times 10^{33}$
- D)  $4.9 \times 10^{34}$

Answer: <https://biology-forums.com/index.php?topic=290506>

### Question 1235

Which alkali metal forms preferentially a peroxide or superoxide?

- A) Li
- B) Na
- C) Cs
- D) Sr

Answer: <https://biology-forums.com/index.php?topic=291868>

### Question 1236

Compared to Si, Cl has a \_\_\_\_\_ effective nuclear charge,  $Z_{\text{eff}}$ , and a \_\_\_\_\_ atomic radius.

Answer: <https://biology-forums.com/index.php?topic=289471>

### Question 1237

The number of atoms of carbon in 28 g of silicon is

- A) 28
- B)  $28 \times 6.022 \times 10^{22}$
- C)  $2.8 \times 10^{23}$
- D)  $6.022 \times 10^{23}$

Answer: <https://biology-forums.com/index.php?topic=288982>

### Question 1238

What is the identity of element Q if the ion  $Q^{2+}$  contains 18 electrons?

- A) Si
- B) S
- C) Ar
- D) Ca

Answer: <https://biology-forums.com/index.php?topic=289000>

### Question 1239

The highest coordination number for spherical packing is found in the

- A) body-centered cubic structure.
- B) simple cubic structure.
- C) body-centered cubic and face-centered cubic.
- D) cubic closest-packing and hexagonal closest packing.

Answer: <https://biology-forums.com/index.php?topic=290112>

### Question 1240

Which of the hydrogen halide acids is used to etch glass?

- A) HF
- B) HCl
- C) HBr
- D) HI

Answer: <https://biology-forums.com/index.php?topic=291827>

### Question 1241

The property of a wave that is associated with brightness or intensity is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289453>

### Question 1242

What is the identity of substance X if 0.380 mol of X weighs 17.5 g?

- A)  $\text{NO}_2$
- B)  $\text{NO}_3$
- C)  $\text{N}_2\text{O}$
- D)  $\text{N}_2\text{O}_4$

Answer: <https://biology-forums.com/index.php?topic=289085>

### Question 1243

Which of the following volumes is equal to 50 mL?

- A) 50  $\text{cm}^3$
- B) 50  $\text{dm}^3$
- C) 0.50 L
- D) 0.00050 kL

Answer: <https://biology-forums.com/index.php?topic=288808>

### Question 1244

What is the minimum energy barrier that must be overcome for a chemical reaction to occur?

- A) activation energy
- B) net energy

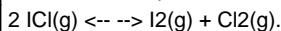


- C) potential energy
- D) rate limiting energy

Answer: <https://biology-forums.com/index.php?topic=290388>

### Question 1245

At a certain temperature the equilibrium constant,  $K_c$ , equals 0.11 for the reaction:



What is the equilibrium concentration of ICl if 0.75 mol of  $\text{I}_2$  and 0.75 mol of  $\text{Cl}_2$  are initially mixed in a 2.0-L flask?

- A) 0.23 M
- B) 0.28 M
- C) 0.45 M
- D) 0.56

Answer: <https://biology-forums.com/index.php?topic=290538>

### Question 1246

Convert 17 m<sup>3</sup> to liters.

- A)  $1.7 \times 10^{-2}$  L
- B) 1.7 L
- C)  $1.7 \times 10^2$  L
- D)  $1.7 \times 10^4$  L

Answer: <https://biology-forums.com/index.php?topic=288814>

### Question 1247

Which has the largest atomic radius?

- A) La
- B) W
- C) Os
- D) Hg

Answer: <https://biology-forums.com/index.php?topic=291538>

### Question 1248

What is the pH of a solution made by mixing 100.0 mL of 0.10 M  $\text{HNO}_3$ , 50.0 mL of 0.20 M  $\text{HCl}$ , and 100.0 mL of water? Assume that the volumes are additive.

- A) 0.30
- B) 0.82
- C) 1.00
- D) 1.10

Answer: <https://biology-forums.com/index.php?topic=290678>

### Question 1249

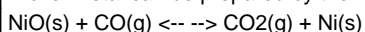
Which is expected to have the largest carbon-oxygen bond dissociation energy?

- A) CO
- B)  $\text{CO}_2$
- C)  $\text{H}_2\text{CO}_3$
- D)  $\text{HCOOH}$

Answer: <https://biology-forums.com/index.php?topic=289877>

### Question 1250

Nickel metal can be prepared by the reduction of nickel oxide:



At 936 K,  $K_p = 4.54 \times 10^3$  and at 1125 K,  $K_p = 1.58 \times 10^3$ . Which statement is true?

- A) The activation energy decreases with increasing temperature.
- B) The activation energy increases with increasing temperature.
- C) The reaction is endothermic.
- D) The reaction is exothermic.

Answer: <https://biology-forums.com/index.php?topic=290562>

### Question 1251

Assume that you start with a mixture containing 0.80 mol of decane and 0.20 mol of octane, what is the vapor composition at the boiling point?

- A) 100% decane

- B) composition at point b  
C) composition at point c  
D) composition at point e

Answer: <https://biology-forums.com/index.php?topic=290265>

### Question 1252

Chlorine belongs to the \_\_\_\_\_ group of the periodic table.

- A) alkali metal  
B) alkaline earth metal  
C) halogen  
D) noble gas

Answer: <https://biology-forums.com/index.php?topic=288946>

### Question 1253

The average distance between nitrogen and oxygen atoms is 115 pm in a compound called nitric oxide. What is this distance in centimeters?

- A)  $1.15 \times 10^{-7}$  cm  
B)  $1.15 \times 10^{-8}$  cm  
C)  $1.15 \times 10^{13}$  cm  
D)  $1.15 \times 10^{18}$  cm

Answer: <https://biology-forums.com/index.php?topic=288804>

### Question 1254

Compound A is a solid with a melting point of 85°C, and compound B is a gas at 75°C and one atmosphere pressure. Based on these data, one would expect

- A) both compounds to be covalent.  
B) compound A to be ionic and compound B to be covalent.  
C) compound A to be covalent and compound B to be ionic.  
D) both compounds to be ionic.

Answer: <https://biology-forums.com/index.php?topic=289632>

### Question 1255

The formula for tetraaminediiodochromium(III) bromide is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291593>

### Question 1256

Oxygen-16 (15.994915 amu) is synthesized in the sun by fusion of  $^{12}\text{C}$  (12.000000 amu) and  $^4\text{He}$  (4.00260 amu). How much energy is released in this nuclear reaction?

- A)  $2.48 \times 10^3$  kJ/mol  
B)  $2.30 \times 10^6$  kJ/mol  
C)  $6.92 \times 10^8$  kJ/mol  
D)  $7.20 \times 10^{11}$  kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291385>

### Question 1257

Metals tend to react with the halogens to form metal halides. What is the reactivity order for the halogens?

- A)  $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$   
B)  $\text{Cl}_2 > \text{F}_2 > \text{Br}_2 > \text{I}_2$   
C)  $\text{Br}_2 > \text{I}_2 > \text{Cl}_2 > \text{F}_2$   
D)  $\text{I}_2 > \text{Br}_2 > \text{Cl}_2 > \text{F}_2$

Answer: <https://biology-forums.com/index.php?topic=291826>

### Question 1258

The number of semimetals in group 4A of the periodic table is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291910>

### Question 1259

Mendeleev arranged the elements according to

- A) atomic number and atomic weight.  
B) atomic weight and chemical reactivity.

C) electron configuration and atomic weight.

D) physical state and relative abundance.

Answer: <https://biology-forums.com/index.php?topic=288864>

### Question 1260

What is the hydronium ion concentration of a 0.100 M acetic acid solution with a  $K_a = 1.8 \times 10^{-5}$ ? The equation for the dissociation of acetic acid is:  
 $\text{CH}_3\text{CO}_2\text{H}(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{H}_3\text{O}^+(\text{aq}) + \text{CH}_3\text{CO}_2^-(\text{aq})$ .

A)  $1.3 \times 10^{-2}$  M

B)  $4.2 \times 10^{-2}$  M

C)  $1.3 \times 10^{-3}$  M

D)  $4.2 \times 10^{-3}$  M

Answer: <https://biology-forums.com/index.php?topic=290687>

### Question 1261

Iodine-123, used in thyroid therapy, has a half-life of 13.27 hours. How many half-lives are required for a 160 mg sample of iodine-123 to decay to 5.0 mg?

A) 0.031

B) 1.0

C) 5.0

D) 32

Answer: <https://biology-forums.com/index.php?topic=291355>

### Question 1262

Which compound, shown with its dipole moment, is expected to exhibit the smallest percent ionic character?

A)  $\text{CCl}_4$

B) HBr

C) KCl

D)  $\text{CH}_2\text{Cl}_2$

Answer: <https://biology-forums.com/index.php?topic=289743>

### Question 1263

A balloon filled with helium gas at  $20^\circ\text{C}$  occupies 3.91 L at 1.00 atm. The balloon is immersed in liquid nitrogen at  $-196^\circ\text{C}$ , raising the pressure to 5.20 atm. What is the volume of the balloon in the liquid nitrogen?

A) 0.20 L

B) 2.6 L

C) 5.3 L

D) 77 L

Answer: <https://biology-forums.com/index.php?topic=289996>

### Question 1264

What is the pressure in a gas container that is connected to an open-end U-tube manometer if the pressure of the atmosphere is 752 torr and the level of mercury in the arm connected to the container is 9.60 cm higher than the level of mercury open to the atmosphere?

A) 656 mm Hg

B) 742 mm Hg

C) 762 mm Hg

D) 848 mm Hg

Answer: <https://biology-forums.com/index.php?topic=289918>

### Question 1265

What is the range of oxidation states that are exhibited by P?

A) from -3 to 0

B) from -2 to +2

C) from -3 to +5

D) from -1 to +5

Answer: <https://biology-forums.com/index.php?topic=291883>

### Question 1266

Which has the lowest melting point?

A) Sc

B) V

- C) Mn
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291525>

### Question 1267

Methane and oxygen react to form carbon dioxide and water. What mass of water is formed if 6.4 g of methane reacts with 25.6 g of oxygen to produce 17.6 g of carbon dioxide?

- A) 14.4 g
- B) 17.6 g
- C) 29.6 g
- D) 32.0 g

Answer: <https://biology-forums.com/index.php?topic=288965>

### Question 1268

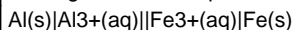
Of the following elements, which has the lowest electronegativity?

- A) Ba
- B) I
- C) Ra
- D) At

Answer: <https://biology-forums.com/index.php?topic=289624>

### Question 1269

In the galvanic cell represented by the shorthand notation



the anode is \_\_\_\_\_ and the cathode is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291264>

### Question 1270

Which of the following is not a type of energy or energy transfer?

- A) thermal energy
- B) heat
- C) height
- D) work

Answer: <https://biology-forums.com/index.php?topic=289847>

### Question 1271

A greenhouse gas is a gas that can experience a change in dipole moment. Which of the following can be greenhouse gases?

- A) O<sub>2</sub>
- B) H<sub>2</sub>
- C) N<sub>2</sub>
- D) CH<sub>3</sub>F

Answer: <https://biology-forums.com/index.php?topic=289986>

### Question 1272

The binding energy for lithium-7 nuclei is  $3.79 \times 10^{12}$  J/mol. The binding energy per nucleon for lithium-7 nuclei is \_\_\_\_\_ MeV/nucleon.

Answer: <https://biology-forums.com/index.php?topic=291467>

### Question 1273

Which one of the following is expected to be the strongest Lewis acid?

- A) Fe
- B) Fe<sup>+</sup>
- C) Fe<sup>2+</sup>
- D) Fe<sup>3+</sup>

Answer: <https://biology-forums.com/index.php?topic=290723>

### Question 1274

Helium-3, an electron, a neutron, and a proton have masses of 3.016029 amu,  $5.486 \times 10^{-4}$  amu, 1.00866 amu, and 1.00728 amu, respectively. The mass defect for the formation of helium-3 is \_\_\_\_\_ amu or \_\_\_\_\_ g/mol.

Answer: <https://biology-forums.com/index.php?topic=291465>

### Question 1275

What is the abbreviation used for the curie, a unit used in the measurement of nuclear disintegrations per unit time?

- A) Cm
- B) Cb
- C) Ci
- D) Ce

Answer: <https://biology-forums.com/index.php?topic=291449>

### Question 1276

If the concentrations of  $\text{Ag}^+(\text{aq})$  and  $\text{Cu}^{2+}(\text{aq})$  are varied in this galvanic cell, which of the following four cells has the largest cell potential?

- A)  $[\text{Ag}^+] = 0.10 \text{ M}$  and  $[\text{Cu}^{2+}] = 0.10 \text{ M}$
- B)  $[\text{Ag}^+] = 1.0 \text{ M}$  and  $[\text{Cu}^{2+}] = 0.10 \text{ M}$
- C)  $[\text{Ag}^+] = 0.10 \text{ M}$  and  $[\text{Cu}^{2+}] = 1.0 \text{ M}$
- D)  $[\text{Ag}^+] = 1.0 \text{ M}$  and  $[\text{Cu}^{2+}] = 1.0 \text{ M}$

Answer: <https://biology-forums.com/index.php?topic=291184>

### Question 1277

Which of the following most likely represent the atomic radius of a Cr atom, the ionic radius of a  $\text{Cr}^{2+}$  ion, and the ionic radius of a  $\text{Cr}^{3+}$  ion?

- A) 128 pm for Cr, 167 pm for  $\text{Cr}^{2+}$ , and 193 pm for  $\text{Cr}^{3+}$
- B) 128 pm for Cr, 147 pm for  $\text{Cr}^{2+}$ , and 193 pm for  $\text{Cr}^{3+}$
- C) 128 pm for Cr, 109 pm for  $\text{Cr}^{2+}$ , and 63 pm for  $\text{Cr}^{3+}$
- D) 128 pm for Cr, 89 pm for  $\text{Cr}^{2+}$ , and 63 pm for  $\text{Cr}^{3+}$

Answer: <https://biology-forums.com/index.php?topic=289481>

### Question 1278

Using principles discussed in chapters 15 and 19, determine which of the following is the strongest acid.

- A)  $\text{HClO}_2$
- B)  $\text{HClO}_3$
- C)  $\text{HBrO}_3$
- D)  $\text{HIO}_3$

Answer: <https://biology-forums.com/index.php?topic=291834>

### Question 1279

Which one of the following is a p-type of semiconductor?

- A) germanium doped with antimony
- B) germanium doped with boron
- C) tellurium
- D)  $\text{YBa}_2\text{Cu}_3\text{O}_7$

Answer: <https://biology-forums.com/index.php?topic=291633>

### Question 1280

When zinc sulfide undergoes roasting, the products are

- A) Zn and S.
- B) Zn and  $\text{H}_2\text{S}$ .
- C) ZnO and S.
- D) ZnO and  $\text{SO}_2$ .

Answer: <https://biology-forums.com/index.php?topic=291605>

### Question 1281

The coordination number of chromium in  $[\text{Cr}(\text{EDTA})]^-$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291590>

### Question 1282

What is the ground-state electron configuration of V?

- A)  $[\text{Ar}]3d^5$
- B)  $[\text{Ar}]4s13d^4$
- C)  $[\text{Ar}]4s23d^3$
- D)  $[\text{Ar}]4s24p64d^1$

Answer: <https://biology-forums.com/index.php?topic=289433>

### Question 1283

The alkane, 3-ethyl-3-methylhexane contains \_\_\_\_\_ carbon atoms and \_\_\_\_\_ hydrogen atoms.

Answer: <https://biology-forums.com/index.php?topic=292057>

### Question 1284

Which compound below could have a zero dipole moment?

- A)  $\text{CCl}_2\text{F}_2$  (tetrahedral)
- B)  $\text{CuCl}_2\text{F}_2$  (tetrahedral)
- C)  $\text{PtCl}_2\text{F}_2$  (square planar)
- D)  $\text{SCl}_2\text{F}_2$  (see-saw)

Answer: <https://biology-forums.com/index.php?topic=289686>

### Question 1285

A 75.0 L steel tank at  $20.0^\circ\text{C}$  contains acetylene gas,  $\text{C}_2\text{H}_2$ , at a pressure of 1.20 atm. Assuming ideal behavior, how many grams of acetylene are in the tank?

- A) 3.74 g
- B) 54.8 g
- C) 97.3 g
- D) 1425 g

Answer: <https://biology-forums.com/index.php?topic=289937>

### Question 1286

Which acid, if any, is a strong acid?

- A) All are strong acids.
- B) HX and HZ
- C) HY
- D) None are strong acids.

Answer: <https://biology-forums.com/index.php?topic=290725>

### Question 1287

The gas Freon-11,  $\text{CCl}_3\text{F}$ , contains

- A)  $\text{C}^{4+}$ ,  $\text{Cl}^-$ , and  $\text{F}^-$  ions.
- B)  $\text{C}^{4+}$ ,  $\text{Cl}_3^-$ , and  $\text{F}^-$  ions.
- C)  $\text{C}^{4+}$  and  $\text{Cl}_3\text{F}_4^-$  ions.
- D)  $\text{CCl}_3\text{F}$  molecules.

Answer: <https://biology-forums.com/index.php?topic=288919>

### Question 1288

Which is the crystal field energy level diagram for an octahedral  $\text{ML}_6$  complex?

- A) (A)
- B) (B)
- C) (C)
- D) (D)

Answer: <https://biology-forums.com/index.php?topic=291541>

### Question 1289

Which period 2 element has successive first through seventh ionization energies (kJ/mol) of  $E_{i1} = 1,402$ ;  $E_{i2} = 2,856$ ;  $E_{i3} = 4,578$ ;  $E_{i4} = 7,475$ ;  $E_{i5} = 9,445$ ;  $E_{i6} = 53,267$ ; and  $E_{i7} = 64,360$ ?

- A) B
- B) C
- C) N
- D) O

Answer: <https://biology-forums.com/index.php?topic=289498>

### Question 1290

If 1.4% of the mass of a human body is calcium, how many kilograms of calcium are there in a 195-pound man?

- A) 1.2 kg Ca

- B) 6.0 kg Ca
- C)  $1.2 \times 10^2$  kg Ca
- D)  $6.0 \times 10^2$  kg

Answer: <https://biology-forums.com/index.php?topic=288837>

### Question 1291

Which is classified as an amphoteric binary oxide?

- A)  $B_2O_3$
- B)  $CO_2$
- C)  $Ga_2O_3$
- D)  $Rb_2O$

Answer: <https://biology-forums.com/index.php?topic=291896>

### Question 1292

Using only the elements Be, Cl, and/or P, give the formula of a compound having largely ionic bonds.

Answer: <https://biology-forums.com/index.php?topic=289652>

### Question 1293

Of the following, which element has the highest first ionization energy?

- A) Ra
- B) Fr
- C) K
- D) Sr

Answer: <https://biology-forums.com/index.php?topic=289535>

### Question 1294

In which set are all compounds considered to be ionic binary hydrides?

- A) LiH, KH,  $MgH_2$ ,  $BaH_2$
- B)  $MgH_2$ ,  $SrH_2$ ,  $AlH_3$ ,  $SiH_4$
- C)  $MgH_2$ ,  $B_2H_6$ ,  $CH_4$ ,  $NH_3$
- D)  $MgH_2$ ,  $AlH_3$ ,  $SiH_4$ ,  $H_2Se$

Answer: <https://biology-forums.com/index.php?topic=291861>

### Question 1295

How many  $H^+$  ions can the acid  $CH_3CO_2H$  donate per molecule?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=289236>

### Question 1296

An element Y, has the following ionization energies

- $E_{i1} = 578$  kJ/mol
- $E_{i2} = 1,817$  kJ/mol
- $E_{i3} = 2,745$  kJ/mol
- $E_{i4} = 11,575$  kJ/mol

What is the most likely identity for this element?

- A) Na
- B) Mg
- C) Al
- D) Si

Answer: <https://biology-forums.com/index.php?topic=289499>

### Question 1297

A 0.020 m aqueous solution containing which solute will have the lowest freezing point?

- A) LiCl
- B) NaF
- C) KCl
- D) All will have approximately the same freezing point.

Answer: <https://biology-forums.com/index.php?topic=290318>

### Question 1298

What is the approximate pH of a solution X that gives the following responses with the indicators shown?

Indicators HIn — In- pH range Solution X

methyl orange red-yellow 3.2-4.4 yellow

methyl red red-yellow 4.8-6.0 orange

bromothymol blue yellow-blue 6.0-7.6 yellow

phenolphthalein colorless-pink 8.2-10.0 colorless

A) 3.2 - 4.4

B) 4.8 - 6.0

C) 6.0 - 7.6

D) 8.2 - 10.0

Answer: <https://biology-forums.com/index.php?topic=290669>

### Question 1299

What is the mass of one atom of the element hydrogen?

A) 2.0 g

B) 1.0 g

C)  $3.4 \times 10^{-24}$  g

D)  $1.7 \times 10^{-24}$  g

Answer: <https://biology-forums.com/index.php?topic=288908>

### Question 1300

How many protons (p) and neutrons (n) are in an atom of Sr?

A) 38 p, 52 n

B) 38 p, 90 n

C) 52 p, 38 n

D) 90 p, 38 n

Answer: <https://biology-forums.com/index.php?topic=288894>

### Question 1301

Ammonium bromide is a crystalline solid that decomposes endothermically when heated:

$\text{NH}_4\text{Br}(s) \rightleftharpoons \text{NH}_3(g) + \text{HBr}(g)$ . When solid  $\text{NH}_4\text{Br}$  is added to an evacuated flask at  $300^\circ\text{C}$ , which change in reaction conditions below will cause the equilibrium to shift to the right?

A) add more HBr

B) add more  $\text{NH}_4\text{Br}$

C) decrease the temperature

D) decrease the pressure

Answer: <https://biology-forums.com/index.php?topic=290594>

### Question 1302

The temperature of 1.00 mL of water is raised by  $1.00^\circ\text{C}$  for every 4.184 joules of heat absorbed by the water. How many liters of water can be raised from  $21.0^\circ\text{C}$  to  $100.0^\circ\text{C}$  by the absorption of 8.88 kcal of heat generated by the combustion of natural gas?

A) 0.112 L

B) 2.13 L

C) 37.2 L

D) 168 L

Answer: <https://biology-forums.com/index.php?topic=288778>

### Question 1303

For the reaction:  $\text{N}_2(g) + 2 \text{O}_2(g) \rightleftharpoons 2 \text{NO}_2(g)$ ,  $K_c = 8.3 \times 10^{-10}$  at  $25^\circ\text{C}$ . What is the concentration of  $\text{N}_2$  gas at equilibrium when the concentration of  $\text{NO}_2$  is twice the concentration of  $\text{O}_2$  gas?

A)  $2.1 \times 10^{-10}$  M

B)  $4.2 \times 10^{-10}$  M

C)  $2.4 \times 10^9$  M

D)  $4.8 \times 10^9$  M

Answer: <https://biology-forums.com/index.php?topic=290493>

### Question 1304



Because of the high heat and low humidity in the summer in Death Valley, California, a visitor requires about one quart of water for every two miles traveled on foot. Calculate the approximate number of liters required for a person to walk 30. kilometers in Death Valley.

- A) 8.8 L
- B) 35 L
- C) 91 L
- D) 140 L

Answer: <https://biology-forums.com/index.php?topic=288774>

### Question 1305

Which of the following elements is not a solid at room temperature?

- A) Ag
- B) Al
- C) He
- D) Fe

Answer: <https://biology-forums.com/index.php?topic=288951>

### Question 1306

What is the average oxidation state of Cu in  $\text{HgCa}_2\text{Ba}_2\text{Cu}_3\text{O}_{8-x}$  if Hg is in the +2 oxidation state?

- A) +1
- B) +2
- C)  $+2 - 2x/3$
- D)  $+2 + 2x/3$

Answer: <https://biology-forums.com/index.php?topic=291639>

### Question 1307

At the equilibrium bond length

- A) the attractive forces holding the atoms together are less than the repulsive forces.
- B) the potential energy is a maximum.
- C) the potential energy is a minimum.
- D) the repulsive forces are greater than the attractive forces holding the atoms together.

Answer: <https://biology-forums.com/index.php?topic=289583>

### Question 1308

Which of the following solutions has the highest concentration of hydroxide ions  $[\text{OH}^-]$ ?

- A) pH = 3.21
- B) pH = 7.83
- C) pH = 10.93
- D) pH = 12.04

Answer: <https://biology-forums.com/index.php?topic=290666>

### Question 1309

Which statement below regarding the half-life of a zeroth-order reaction is true?

- A) Each half-life is half as long as the preceding half-life.
- B) Each half-life is twice as long as the preceding half-life.
- C) Each half-life is four times as long as the preceding half-life.
- D) The half-life remains unchanged throughout the course of the reaction.

Answer: <https://biology-forums.com/index.php?topic=290368>

### Question 1310

The property of a liquid that measure the liquid's resistance to spread out and increase its surface area is

- A) sublimation point.
- B) heat of deposition.
- C) dipole-dipole forces.
- D) surface tension.

Answer: <https://biology-forums.com/index.php?topic=290133>

### Question 1311

What is a principal commercial ore for the element aluminum?

- A) bauxite
- B) chalcopyrite

C) galena

D) rutile

Answer: <https://biology-forums.com/index.php?topic=291656>

### Question 1312

When dissolved in water, of HClO<sub>4</sub>, NH<sub>3</sub>, KOH, HI, and CH<sub>3</sub>OH which are acids?

A) NH<sub>3</sub> and KOH

B) HClO<sub>4</sub> and HI

C) only HI

D) only KOH

Answer: <https://biology-forums.com/index.php?topic=289231>

### Question 1313

Which electron on an atom of palladium would have the highest value of W in the Boltzmann formula?

A) 3s

B) 4d

C) 4s

D) 3p

Answer: <https://biology-forums.com/index.php?topic=291029>

### Question 1314

If 1.0 gram each of Cl<sub>2</sub>, CO<sub>2</sub>, N<sub>2</sub>, and O<sub>2</sub> are contained in a 5-L flask, the gas with the highest partial pressure is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290061>

### Question 1315

A student measured the diameter of a sphere and determined the average value. His measurements are \_\_\_\_\_ and \_\_\_\_\_. If the true diameter is 6.18 cm, what can be said about the student's results?

A) It is accurate and precise.

B) It is accurate but not precise.

C) It is precise but not accurate.

D) It is neither precise nor accurate.

Answer: <https://biology-forums.com/index.php?topic=288825>

### Question 1316

Which of the following statements about properties of organic compounds is not correct?

A) Most organic compounds are not soluble in water.

B) Most organic compounds do not conduct electricity.

C) Organic compounds have higher melting and boiling points than ionic compounds.

D) Organic compounds have weak intermolecular forces.

Answer: <https://biology-forums.com/index.php?topic=291934>

### Question 1317

Of the following, which element has the highest first ionization energy?

A) indium

B) rubidium

C) tin

D) strontium

Answer: <https://biology-forums.com/index.php?topic=289533>

### Question 1318

Tablets of ascorbic acid, or Vitamin C, C<sub>6</sub>H<sub>8</sub>O<sub>6</sub>, are taken as a dietary supplement. If a typical tablet contains 500 mg, how many atoms of carbon (C) are in a tablet?

Answer: <https://biology-forums.com/index.php?topic=289195>

### Question 1319

Which of the following is not true?

A) The sp<sup>3</sup> hybrid orbitals are degenerate.

B) An sp<sup>3</sup> hybrid orbital may hold a lone pair of electrons.

C) An sp<sup>3</sup> hybrid orbital may form a sigma bond by overlap with an orbital on another atom.

D) An  $sp^3$  hybrid orbital may form a pi bond by overlap with an orbital on another atom.

Answer: <https://biology-forums.com/index.php?topic=289672>

### Question 1320

For the reaction  $A_2 + 2 B_3 \rightleftharpoons 2 AB_3$ , the rate of the forward reaction is 0.25 M/s and the rate of the reverse reaction is 0.75 M/s. The reaction is not at equilibrium. In order to attain equilibrium the reaction must proceed in the \_\_\_\_\_ (forward, reverse) direction in order to achieve equilibrium.

Answer: <https://biology-forums.com/index.php?topic=290618>

### Question 1321

What volume of a 0.716 M KBr solution is needed to provide 10.5 g of KBr?

- A) 7.52 mL
- B) 14.7 mL
- C) 63.2 mL
- D) 123 mL

Answer: <https://biology-forums.com/index.php?topic=290282>

### Question 1322

One way to prepare a solution with a pH of 10.00 is to dissolve \_\_\_\_\_ grams of CaO in enough water to make 500 mL of solution.

Answer: <https://biology-forums.com/index.php?topic=290810>

### Question 1323

What statement is inconsistent with the chemistry of copper?

- A) It has a high electrical conductivity and is widely used to make electrical wiring.
- B) It is commonly found in the elemental state.
- C) It is a reddish colored metal that accounts for only 0.0068% of the earth's crust by mass.
- D) It is used to make corrosion-resistant water pipes because it has a positive oxidation potential.

Answer: <https://biology-forums.com/index.php?topic=291504>

### Question 1324

Which of these neutralization reactions has a pH < 7 when equal molar amounts of acid and base are mixed?

- A)  $CH_3CO_2H(aq) + NaOH(aq) \rightleftharpoons H_2O(l) + NaCH_3CO_2(aq)$
- B)  $HCl(aq) + C_5H_5N(aq) \rightleftharpoons C_5H_5NHCl(aq)$
- C)  $HBr(aq) + KOH(aq) \rightleftharpoons H_2O(l) + KBr(aq)$
- D)  $H_2SO_4(aq) + 2 NaOH(aq) \rightleftharpoons 2 H_2O(l) + Na_2SO_4(aq)$

Answer: <https://biology-forums.com/index.php?topic=290891>

### Question 1325

Which contains covalent bonds?

- A) LiOO
- B) NH<sub>3</sub>
- C) LiCl
- D) CaI<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289523>

### Question 1326

Which one of the following elements is a poor conductor of heat and electricity?

- A) copper
- B) phosphorus
- C) iron
- D) lead

Answer: <https://biology-forums.com/index.php?topic=288954>

### Question 1327

Some assumptions from the kinetic molecular theory are listed below. Which one is most frequently cited to explain compressibility of a gas?

- A) The average kinetic energy of gas particles is proportional to the Kelvin temperature.
- B) Collisions of gas particles are elastic and total kinetic energy of the gas is constant.
- C) A gas consist of tiny particles moving in random straight line motion.
- D) The volume of the particles is negligible compared to the volume of the gas.

Answer: <https://biology-forums.com/index.php?topic=289965>

### Question 1328

What is the concentration of an  $\text{AlCl}_3$  solution if 150. mL of the solution contains 250. mg of  $\text{Cl}^-$  ion?

- A)  $1.57 \times 10^{-2}$  M
- B)  $3.75 \times 10^{-2}$  M
- C)  $4.70 \times 10^{-2}$  M
- D)  $1.41 \times 10^{-1}$  M

Answer: <https://biology-forums.com/index.php?topic=289289>

### Question 1329

The decomposition of ammonia is:  $2 \text{NH}_3(\text{g}) = \text{N}_2(\text{g}) + 3 \text{H}_2(\text{g})$ . If  $K_p$  is  $1.5 \times 10^3$  at  $400^\circ\text{C}$ , what is the partial pressure of ammonia at equilibrium when  $\text{N}_2$  is 0.10 atm and  $\text{H}_2$  is 0.15 atm?

- A)  $2.2 \times 10^{-7}$  atm
- B)  $4.7 \times 10^{-4}$  atm
- C)  $2.1 \times 10^3$  atm
- D)  $4.4 \times 10^6$  atm

Answer: <https://biology-forums.com/index.php?topic=290508>

### Question 1330

Which of the following is a part of Dalton's atomic theory?

- A) Atoms are rearranged but not changed during a chemical reaction.
- B) Atoms break down during radioactive decay.
- C) Atoms contain protons, neutrons, and electrons.
- D) Isotopes of the same element have different masses.

Answer: <https://biology-forums.com/index.php?topic=288884>

### Question 1331

What is the ground-state electron configuration of the ion  $\text{Hg}^{2+}$ ?

- A)  $[\text{Xe}]4f^{14}5d^{10}$
- B)  $[\text{Xe}]4f^{14}5d^{8}6s^2$
- C)  $[\text{Xe}]4f^{14}5d^{10}6s^2$
- D)  $[\text{Xe}]4f^{14}5d^{10}6s^2 6p^2$

Answer: <https://biology-forums.com/index.php?topic=289472>

### Question 1332

The four cyclic amine bases that occur in DNA are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292067>

### Question 1333

Which is paramagnetic?

- A)  $\text{N}_2^{2+}$
- B)  $\text{N}_2^-$
- C)  $\text{O}_2^{2+}$
- D)  $\text{O}_2^-$

Answer: <https://biology-forums.com/index.php?topic=289702>

### Question 1334

In order for a cell potential to be a standard cell potential, the concentration of all ions in solution must be \_\_\_\_\_ M, the partial pressures of all gaseous species must be \_\_\_\_\_ atm, and the temperature must be \_\_\_\_\_ K.

Answer: <https://biology-forums.com/index.php?topic=291297>

### Question 1335

Which alkali metal reacts with nitrogen to form a nitride?

- A) Li
- B) Na
- C) K
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=291727>

### Question 1336

Calculate the  $K_{sp}$  for silver sulfite if the solubility of  $Ag_2SO_3$  in pure water is  $4.6 \times 10^{-3}$  g/L.

- A)  $3.8 \times 10^{-15}$
- B)  $1.5 \times 10^{-14}$
- C)  $2.4 \times 10^{-10}$
- D)  $4.8 \times 10^{-10}$

Answer: <https://biology-forums.com/index.php?topic=290918>

### Question 1337

To two significant figures, by what factor will the pressure of an ideal gas change if the temperature of the gas is changed from  $100^\circ\text{C}$  to  $200^\circ\text{C}$ ?

Answer: <https://biology-forums.com/index.php?topic=290056>

### Question 1338

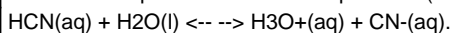
Calculate the hydroxide ion concentration in an aqueous solution that contains  $3.50 \times 10^{-3}$  M in hydronium ion.

- A)  $2.86 \times 10^{-4}$  M
- B)  $2.86 \times 10^{-11}$  M
- C)  $2.86 \times 10^{-12}$  M
- D)  $3.50 \times 10^{-12}$  M

Answer: <https://biology-forums.com/index.php?topic=290652>

### Question 1339

What is the equilibrium constant expression ( $K_a$ ) for the acid dissociation of hydrocyanic acid HCN? The equation of interest is



- A)  $K_a = \frac{[\text{H}_3\text{O}^+][\text{CN}^-]}{[\text{HCN}][\text{H}_2\text{O}]}$
- B)  $K_a = \frac{[\text{H}_3\text{O}^+][\text{CN}^-]}{[\text{HCN}]}$
- C)  $K_a = \frac{[\text{HCN}][\text{H}_2\text{O}]}{[\text{H}_3\text{O}^+][\text{CN}^-]}$
- D)  $K_a = \frac{[\text{HCN}]}{[\text{H}_3\text{O}^+][\text{CN}^-]}$

Answer: <https://biology-forums.com/index.php?topic=290679>

### Question 1340

What statement is inconsistent about fullerene?

- A) It is an allotrope of carbon and the  $C_{60}$  form has soccer ball shape.
- B) The  $C_{60}$  form of fullerene is a good oxidizing agent.
- C) The  $C_{60}$  fullerene is a molecular substance.
- D) The  $C_{60}$  form of fullerene is soluble in nonpolar organic solvents.

Answer: <https://biology-forums.com/index.php?topic=291768>

### Question 1341

The ions  $\text{ClO}_4^-$ ,  $\text{ClO}_3^-$ ,  $\text{ClO}_2^-$ , and  $\text{ClO}^-$  are named respectively

- A) hypochlorate, chlorate, chlorite, perchlorite.
- B) hypochlorite, chlorite, chlorate, perchlorate.
- C) perchlorate, chlorate, chlorite, hypochlorite.
- D) perchlorite, chlorite, chlorate, hypochlorate.

Answer: <https://biology-forums.com/index.php?topic=288923>

### Question 1342

In an open end manometer, one end of a U-tube filled with mercury is attached to a gas-filled container and the other end is open to the atmosphere. If the gas pressure in the container is less than atmospheric pressure

- A) Hg will be forced out of the open end of the U-tube.
- B) the difference between the Hg levels in the two arms will be greater than 76 cm.
- C) the Hg level will be higher in the arm connected to the container.
- D) the Hg level will be higher in the arm open to the atmosphere.

Answer: <https://biology-forums.com/index.php?topic=289917>

### Question 1343

What is the approximate pH at the equivalence point of a weak acid-strong base titration if 25 mL of aqueous hydrofluoric acid requires 30.00 mL of 0.100 M NaOH?  $K_a = 6.76 \times 10^{-4}$  for HF.

- A) 2.05

- B) 6.05
- C) 7.95
- D) 11.95

Answer: <https://biology-forums.com/index.php?topic=290907>

### Question 1344

A particular 12V battery is based on a reaction having a standard cell potential,  $E^\circ = +1.92$  V. What happens when the battery "dies"?

- A)  $E^\circ = 12$  V and  $E = 0$  V
- B)  $E^\circ = 0$  V and  $E = 12$  V
- C)  $E^\circ = +1.92$  V and  $E = 0$  V
- D)  $E^\circ = +1.92$  V and  $E = 12$  V

Answer: <https://biology-forums.com/index.php?topic=291236>

### Question 1345

A certain metal crystallizes in a face-centered cubic structure. What is the edge length of the unit cell if the atomic radius of the metal is 134 pm?

- A) 189 pm
- B) 268 pm
- C) 309 pm
- D) 379 pm

Answer: <https://biology-forums.com/index.php?topic=290158>

### Question 1346

Which of the following can be classified as a weak base?

- A)  $\text{CH}_3\text{NH}_2$
- B)  $\text{NH}_2\text{OH}$
- C) Both  $\text{CH}_3\text{NH}_2$  and  $\text{NH}_2\text{OH}$
- D) Neither  $\text{CH}_3\text{NH}_2$  nor  $\text{NH}_2\text{OH}$

Answer: <https://biology-forums.com/index.php?topic=290703>

### Question 1347

What is the coldest temperature possible?

- A)  $0^\circ\text{C}$
- B)  $0^\circ\text{F}$
- C) 0 K
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=288747>

### Question 1348

Which unit of radiation describes the amount of radiation emitted by a radioactive substance?

- A) becquerel
- B) gray
- C) rad
- D) rem

Answer: <https://biology-forums.com/index.php?topic=291400>

### Question 1349

Though we would expect an increase in atomic radii going down a group from the second to the third transition series of elements, the actual radii are nearly identical. The term commonly used to describe this phenomenon is the

- A) atomic disparity.
- B) effective nuclear charge.
- C) lanthanide contraction.
- D) transition default.

Answer: <https://biology-forums.com/index.php?topic=291488>

### Question 1350

A nanoparticle that exhibits a yellow color is (larger/smaller) \_\_\_\_\_ than a nanoparticle that exhibits a red color.

Answer: <https://biology-forums.com/index.php?topic=291708>

### Question 1351

At 25°C, a certain first order reaction has a rate constant equal to  $1.00 \times 10^{-3} \text{ s}^{-1}$  and an equilibrium constant,  $K_c$ , equal to 4.18. What is the rate constant for the reverse reaction?

- A)  $2.39 \times 10^{-4} \text{ s}^{-1}$
- B)  $4.18 \times 10^{-3} \text{ s}^{-1}$
- C)  $2.39 \times 10^2 \text{ s}^{-1}$
- D)  $4.18 \times 10^3 \text{ s}^{-1}$

Answer: <https://biology-forums.com/index.php?topic=290561>

### Question 1352

Of the following elements, which has a melting point slightly above room temperature?

- A) B
- B) Ga
- C) In
- D) Tl

Answer: <https://biology-forums.com/index.php?topic=291737>

### Question 1353

Each of three identical 15.0-L gas cylinders contains 7.50 mol of gas at 295 K. Cylinder A contains He, cylinder B contains  $\text{CO}_2$ , and cylinder C contains  $\text{SO}_2$ . According to the kinetic molecular theory, which gas has the highest density?

- A) He
- B)  $\text{CO}_2$
- C)  $\text{SO}_2$
- D) All have identical densities

Answer: <https://biology-forums.com/index.php?topic=290037>

### Question 1354

Which of the following decay processes give a product nuclide whose atomic number is one less than the starting nuclide?

- A) alpha decay
- B) beta decay and positron decay
- C) gamma decay and beta decay
- D) positron decay and electron capture

Answer: <https://biology-forums.com/index.php?topic=291339>

### Question 1355

Two metals of equal mass with different heat capacities are subjected to the same amount of heat. Which undergoes the smallest change in temperature?

- A) The metal with the highest heat capacity.
- B) The metal with the lowest heat capacity.
- C) Both undergo the same change in temperature.
- D) You need to know the initial temperatures of both metals.

Answer: <https://biology-forums.com/index.php?topic=289813>

### Question 1356

Human tears have a concentration of  $\text{H}_3\text{O}^+$  that is  $3.16 \times 10^{-8}$ . The concentration of  $\text{OH}^-$  in human tears is

- A) greater than  $3.16 \times 10^{-7}$  and tears are acidic.
- B) greater than  $3.16 \times 10^{-7}$  and tears are basic.
- C) less than  $3.16 \times 10^{-7}$  and tears are acidic.
- D) less than  $3.16 \times 10^{-7}$  and tears are basic.

Answer: <https://biology-forums.com/index.php?topic=290656>

### Question 1357

The coordination number of each atom in a body-centered cubic unit cell is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290179>

### Question 1358

Sodium is an example of an \_\_\_\_\_ metal that reacts with water to form hydrogen gas and an \_\_\_\_\_ solution.

Answer: <https://biology-forums.com/index.php?topic=289046>

### Question 1359

How many protons (p) and neutrons (n) are in an atom of calcium-46?

- A) 20 p, 26 n
- B) 20 p, 46 n
- C) 26 p, 20 n
- D) 46 p, 20 n

Answer: <https://biology-forums.com/index.php?topic=288974>

### Question 1360

When a substance decays by alpha radiation, the mass number of the nucleus \_\_\_\_\_ and the atomic number \_\_\_\_\_.

- A) increases by 4, increases by 2
- B) reduces by 4, reduces by 2
- C) increases by 1, increases by 4
- D) reduces by 3, reduces by 1

Answer: <https://biology-forums.com/index.php?topic=291425>

### Question 1361

What is the most soluble salt of the following set?

- A)  $\text{Ca}(\text{OH})_2$  with  $K_{sp} = 4.7 \times 10^{-6}$
- B)  $\text{Mg}(\text{OH})_2$  with  $K_{sp} = 5.6 \times 10^{-12}$
- C)  $\text{Fe}(\text{OH})_2$  with  $K_{sp} = 4.9 \times 10^{-17}$
- D)  $\text{Al}(\text{OH})_3$  with  $K_{sp} = 1.9 \times 10^{-33}$

Answer: <https://biology-forums.com/index.php?topic=290924>

### Question 1362

Which one of the following is not a main group element?

- A) Fr
- B) Ra
- C) Th
- D) C

Answer: <https://biology-forums.com/index.php?topic=291842>

### Question 1363

Which of the following binary hydrides has the highest melting point?

- A)  $\text{AlH}_3$
- B)  $\text{CaH}_2$
- C)  $\text{NH}_3$
- D)  $\text{SnH}_4$

Answer: <https://biology-forums.com/index.php?topic=291863>

### Question 1364

How many lone pairs are on the central Br atom in  $\text{Br}_3^-$ ?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289641>

### Question 1365

The Lewis electron-dot structure of  $\text{N}_2$  has \_\_\_\_\_ nonbonding electrons pairs, \_\_\_\_\_ bonding electron pairs, and a bond order of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289657>

### Question 1366

The number of  $sp^2$  hybrid orbitals on the carbon atom in  $\text{CO}_3^{2-}$  is

- A) one.
- B) two.
- C) three.
- D) four.

Answer: <https://biology-forums.com/index.php?topic=289673>



### Question 1367

K<sub>p</sub> is equal to 48.70 at 731 K for the reaction: H<sub>2</sub>(g) + I<sub>2</sub>(g) <-- --> 2 HI(g). Initially the mixture contains 0.08592 atm each of H<sub>2</sub> and I<sub>2</sub> and 1.0000 atm of HI. What is the pressure of HI at equilibrium?

- A) 0.7955 atm
- B) 0.9108 atm
- C) 0.9140 atm
- D) 0.9498 atm

Answer: <https://biology-forums.com/index.php?topic=290542>

### Question 1368

Ni has a face-centered unit cell. The number of Ni atoms in the unit cell is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290182>

### Question 1369

A solution of LiCl in water has X<sub>LiCl</sub> = 0.0400. What is the molality?

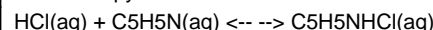
- A) 4.16 m LiCl
- B) 2.22 m LiCl
- C) 2.31 m LiCl
- D) 4.21 m LiCl

Answer: <https://biology-forums.com/index.php?topic=290230>

### Question 1370

What is the approximate value of the equilibrium constant, K<sub>n</sub>, for the neutralization of pyridine with hydrochloric acid, shown in the equation below?

The K<sub>b</sub> for pyridine is 1.8 × 10<sup>-9</sup>.



- A) 5.6 × 10<sup>-10</sup>
- B) 5.6 × 10<sup>-6</sup>
- C) 1.8 × 10<sup>5</sup>
- D) 5.6 × 10<sup>8</sup>

Answer: <https://biology-forums.com/index.php?topic=290826>

### Question 1371

The symbol for technetium-98 is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289052>

### Question 1372

What is the F—B—F bond angle in BF<sub>3</sub>?

- A) less than 109.5°
- B) 109.5°
- C) 120°
- D) greater than 120°

Answer: <https://biology-forums.com/index.php?topic=289664>

### Question 1373

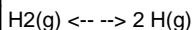
Based on molecular orbital theory, in order to weaken the N—N bond in N<sub>2</sub>, electrons should be

- A) added.
- B) removed.
- C) either added or removed.
- D) neither added nor removed.

Answer: <https://biology-forums.com/index.php?topic=289703>

### Question 1374

K<sub>c</sub> = 1.2 × 10<sup>-42</sup> at 500 K for the reaction shown below.



If [H<sub>2</sub>] = 1 × 10<sup>-2</sup> M and [H] = 1.2 × 10<sup>-22</sup> M, in order to achieve equilibrium a net reaction must occur from \_\_\_\_\_ to \_\_\_\_\_ until Q<sub>c</sub> = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290614>

### Question 1375

Which conducts electricity?

- A) a large collection of iron atoms
- B) a single iron atom
- C) both a large collection of iron atoms and a single iron atom
- D) neither a large collection of iron atoms nor a single iron atom

Answer: <https://biology-forums.com/index.php?topic=289067>

### Question 1376

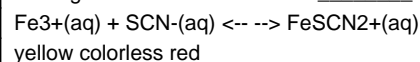
What is the approximate pH at the equivalence point of a weak acid-strong base titration if 25 mL of aqueous hydrofluoric acid requires 30.00 mL of 0.400 M NaOH?  $K_a = 6.76 \times 10^{-4}$  for HF.

- A) 1.74
- B) 5.75
- C) 8.25
- D) 12.26

Answer: <https://biology-forums.com/index.php?topic=290856>

### Question 1377

If additional SCN<sup>-</sup> is added to the equilibrium system shown below, Le Châtelier's principle predicts a net reaction from \_\_\_\_\_ to \_\_\_\_\_, causing the red color to become \_\_\_\_\_.



Answer: <https://biology-forums.com/index.php?topic=290619>

### Question 1378

The polarity of CCl<sub>4</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289768>

### Question 1379

The nitrogen-nitrogen bond in :N N: has a bond order of

- A) 3
- B) 1
- C) 2
- D) 6

Answer: <https://biology-forums.com/index.php?topic=289606>

### Question 1380

Which of the following is not a valid set of quantum numbers?

- A)  $n = 2, l = 1, m_l = 0, \text{ and } m_s = +1/2$
- B)  $n = 2, l = 1, m_l = -1, \text{ and } m_s = +1/2$
- C)  $n = 3, l = 0, m_l = 0, \text{ and } m_s = +1/2$
- D)  $n = 3, l = 2, m_l = 3, \text{ and } m_s = +1/2$

Answer: <https://biology-forums.com/index.php?topic=289427>

### Question 1381

What hybridization scheme is used for Ni in the square planar complex of  $[\text{Ni}(\text{CN})_4]^{2-}$ ?

- A) sp<sup>3</sup>
- B) dsp<sup>2</sup>
- C) dsp<sup>3</sup>
- D) d<sup>2</sup>sp<sup>3</sup>

Answer: <https://biology-forums.com/index.php?topic=291514>

### Question 1382

Which element of group 4A is the most abundant in the earth's crust?

- A) C
- B) Si
- C) Sn
- D) N

Answer: <https://biology-forums.com/index.php?topic=291876>

### Question 1383

What reagent could be used to separate I<sup>-</sup> from CH<sub>3</sub>CO<sub>2</sub><sup>-</sup> when added to an aqueous solution containing both?

- A) AgNO<sub>3</sub> (aq)
- B) Ba(OH)<sub>2</sub> (aq)
- C) CuSO<sub>4</sub> (aq)
- D) NaI (aq)

Answer: <https://biology-forums.com/index.php?topic=289300>

### Question 1384

The pH of a 0.055 M KOH solution is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290813>

### Question 1385

Which one of the following elements forms the most acidic binary oxide?

- A) K
- B) Si
- C) P
- D) As

Answer: <https://biology-forums.com/index.php?topic=291887>

### Question 1386

Which of the following should have the largest dipole moment?

- A) H<sub>2</sub>(g)
- B) CO<sub>2</sub>(g)
- C) KCl(g)
- D) CH<sub>3</sub>F(g)

Answer: <https://biology-forums.com/index.php?topic=289737>

### Question 1387

If dissociation of MgCl<sub>2</sub> in water were 100%, the van't Hoff factor would be \_\_\_\_\_; however, for real solutions the van't Hoff factor for MgCl<sub>2</sub> is \_\_\_\_\_ (greater than, less than) this value.

Answer: <https://biology-forums.com/index.php?topic=290341>

### Question 1388

A solution is prepared by dissolving 20.0 g of sucrose, C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>, in 250. g of water at 25°C. What is the vapor pressure of the solution if the vapor pressure of water at 25°C is 23.76 mm Hg?

- A) 0.198 mm Hg
- B) 20.5 mm Hg
- C) 23.7 mm Hg
- D) 24.0 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290240>

### Question 1389

Which of these neutralization reactions has a pH > 7 when equal moles of acid and base are mixed?

- A) CH<sub>3</sub>CO<sub>2</sub>H(aq) + LiOH(aq) <-- --> H<sub>2</sub>O(l) + LiCH<sub>3</sub>CO<sub>2</sub>(aq)
- B) HI(aq) + C<sub>5</sub>H<sub>5</sub>N(aq) <-- --> C<sub>5</sub>H<sub>5</sub>NHI(aq)
- C) HCl(aq) + LiOH(aq) <-- --> H<sub>2</sub>O(l) + LiCl(aq)
- D) H<sub>2</sub>SO<sub>4</sub>(aq) + 2 KOH(aq) <-- --> 2 H<sub>2</sub>O(l) + K<sub>2</sub>SO<sub>4</sub>(aq)

Answer: <https://biology-forums.com/index.php?topic=290892>

### Question 1390

How many atoms are in one body-centered cubic unit cell of a metal?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=290100>

### Question 1391

List the elements Cs, Ca, Ne, Na, Ar in order of decreasing first ionization energy.

- A) Ar > Ca > Cs > Na > Ne
- B) Ne > Ar > Ca > Na > Cs
- C) Ne > Ar > Na > Cs > Ca
- D) Ne > Na > Cs > Ca > Ar

Answer: <https://biology-forums.com/index.php?topic=289491>

### Question 1392

Which substance is a good semiconductor?

- A) diamond
- B) germanium
- C) gold
- D) phosphorus

Answer: <https://biology-forums.com/index.php?topic=291625>

### Question 1393

Which compound is most likely to exist as a gas at room temperature?

Answer: <https://biology-forums.com/index.php?topic=289656>

### Question 1394

White tin has an electrical conductivity that decreases with increasing temperature, and gray tin has an electrical conductivity that increases with increasing temperature. Therefore, white tin is classified as a(n) \_\_\_\_\_, and gray tin is classified as a(n) \_\_\_\_\_.

- A) insulator, metal
- B) metal, insulator
- C) metal, semiconductor
- D) semiconductor, metal

Answer: <https://biology-forums.com/index.php?topic=291623>

### Question 1395

How many milliliters of a 6.0 M HNO<sub>3</sub> solution are needed to make 0.25 L of a 3.5 M HNO<sub>3</sub> solution?

- A) 686 mL
- B) 428 mL
- C) 146 mL
- D) 119 mL

Answer: <https://biology-forums.com/index.php?topic=289211>

### Question 1396

Which group 6A element is naturally radioactive?

- A) S
- B) U
- C) Dy
- D) Po

Answer: <https://biology-forums.com/index.php?topic=291892>

### Question 1397

Which is most often used in the laboratory to measure pH?

- A) a standard hydrogen electrode
- B) a glass electrode
- C) a Daniell cell
- D) a conductivity cell

Answer: <https://biology-forums.com/index.php?topic=291141>

### Question 1398

Sodium hypochlorite, NaOCl, is the active ingredient in household bleach. What is the concentration of hypochlorite ion if 20.00 mL of bleach requires 28.30 mL of 0.500 M HCl to reach the equivalence point?

- A) 0.208 M
- B) 0.353 M

C) 0.708 M

D) 1.21 M

Answer: <https://biology-forums.com/index.php?topic=290860>

### Question 1399

What is the charge on the In in the ionic compound  $\text{In}_2\text{Te}_3$ ?

A) 2-

B) 1+

C) 2+

D) 3+

Answer: <https://biology-forums.com/index.php?topic=289029>

### Question 1400

Which of the following changes in reaction conditions will not alter the composition of a homogeneous equilibrium mixture of gases in a reaction having unequal moles of gaseous products and reactants?

A) addition of a catalyst

B) addition of reactants

C) decreasing the temperature

D) increasing the volume

Answer: <https://biology-forums.com/index.php?topic=290600>

### Question 1401

Calculate the pH for an aqueous solution of acetic acid that contains  $1.0 \times 10^{-3}$  M hydronium ion.

A)  $2.41 \times 10^{-12}$  M

B)  $4.15 \times 10^{-3}$  M

C) 2.38

D) 11.62

Answer: <https://biology-forums.com/index.php?topic=290754>

### Question 1402

The dose of amoxicillin given to a young child is 40.0 mg/kg of body weight/day. If the amoxicillin is administered as a suspension having a concentration of 400. mg/5 mL, how many mL of amoxicillin must be administered per dose for a child weighing 30.0 pounds?

A) 3.00 mL

B) 6.82 mL

C) 16.0 mL

D) 9.9 mL

Answer: <https://biology-forums.com/index.php?topic=290295>

### Question 1403

What volume of 3.00 M  $\text{CH}_3\text{OH}$  solution is needed to provide 0.320 mol of  $\text{CH}_3\text{OH}$ ?

A) 1.04 mL

B) 9.38 mL

C) 107 mL

D) 960 mL

Answer: <https://biology-forums.com/index.php?topic=290283>

### Question 1404

The normal boiling point of this substance is approximately

A) 25°C.

B) 140°C.

C) 300°C.

D) 350°C.

Answer: <https://biology-forums.com/index.php?topic=290129>

### Question 1405

What is the volume of 20.0 g of argon gas at 157°C and 2.50 kPa pressure?

A) 2.58 L

B) 7.06 L

C) 262 L

D) 716 L

Answer: <https://biology-forums.com/index.php?topic=290007>

### Question 1406

What are the three most abundant elements in the Earth's crust?

- A) H, O, Al
- B) O, Al, Si
- C) O, Si, Ca
- D) Al, C, Fe

Answer: <https://biology-forums.com/index.php?topic=291843>

### Question 1407

One kilogram is slightly more than \_\_\_\_\_ U.S. pounds.

- A) 0.5
- B) 1
- C) 2
- D) 5

Answer: <https://biology-forums.com/index.php?topic=288740>

### Question 1408

How many unpaired electrons are present in the high spin form of the  $[\text{CoF}_6]^{3-}$  complex and what metal orbitals are used in bonding?

- A) 0 unpaired electrons and 4s, 4p and 4d orbitals to give  $sp^3d^2$
- B) 4 unpaired electrons and 4s, 4p and 4d orbitals to give  $sp^3d^2$
- C) 0 unpaired electrons and 3d, 4s, and 4p orbitals to give  $d^2sp^3$
- D) 4 unpaired electrons and 3d, 4s, and 4p orbitals to give  $d^2sp^3$

Answer: <https://biology-forums.com/index.php?topic=291516>

### Question 1409

Pb is the symbol for the element \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289040>

### Question 1410

A property whose value depends only on the present condition of the system and not how the system arrived at that condition is called a \_\_\_\_\_ function.

Answer: <https://biology-forums.com/index.php?topic=289894>

### Question 1411

The standard potential for the following galvanic cell is +0.90 V:



Given that the standard reduction potential for the  $\text{Cu}^{2+}/\text{Cu}$  half-cell is +0.34 V, what is the standard reduction potential for the  $\text{Ga}^{3+}/\text{Ga}$  half-cell?

- A) -1.34 V
- B) -0.56 V
- C) +0.56 V
- D) +1.36 V

Answer: <https://biology-forums.com/index.php?topic=291116>

### Question 1412

What is the basic building block of all silicates?

- A)  $\text{Si}_2\text{O}_6^{4-}$
- B) Si
- C)  $\text{SiO}_2$
- D)  $\text{SiO}_4^{4-}$

Answer: <https://biology-forums.com/index.php?topic=291882>

### Question 1413

What is the structure of rhombic sulfur?

- A) crown shaped  $\text{S}_8$  molecules
- B) discrete S atoms
- C) discrete  $\text{S}_2$  molecules
- D) polymeric Sn chains

Answer: <https://biology-forums.com/index.php?topic=291815>

### Question 1414

Which species does not have an octet of electrons for its outer core?

- A) Si<sup>4-</sup>
- B) As<sup>3-</sup>
- C) Se<sup>2-</sup>
- D) Mg<sup>+</sup>

Answer: <https://biology-forums.com/index.php?topic=289549>

### Question 1415

Of XeF<sub>2</sub> and XeF<sub>4</sub>, the one with the smaller bond angles is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289757>

### Question 1416

The VSEPR model predicts the H—B—H bond angle in BH<sub>3</sub> to be

- A) 90°.
- B) 109.5°.
- C) less than 120° but greater than 109.5°.
- D) 120°.

Answer: <https://biology-forums.com/index.php?topic=289730>

### Question 1417

Which of the following gases has the lowest average speed at 25°C?

- A) C<sub>2</sub>H<sub>6</sub>
- B) H<sub>2</sub>Se
- C) PH<sub>3</sub>
- D) F<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290031>

### Question 1418

When silver nitrate reacts with barium chloride, silver chloride and barium nitrate are formed. How many grams of silver chloride are formed when 10.8 g of silver nitrate reacts with 15.0 g of barium chloride?

- A) 9.11 g
- B) 9.40 g
- C) 12.9 g
- D) 18.8 g

Answer: <https://biology-forums.com/index.php?topic=289174>

### Question 1419

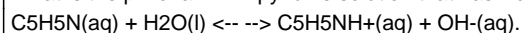
Covalent hydrides of the type MH<sub>3</sub> are likely to form with elements of what group?

- A) 3A
- B) 4A
- C) 5A
- D) 6A

Answer: <https://biology-forums.com/index.php?topic=291724>

### Question 1420

What is the pH of a 2.4 M pyridine solution that has  $K_b = 1.9 \times 10^{-9}$ ? The equation for the dissociation of pyridine is



- A) 4.17
- B) 8.72
- C) 9.83
- D) 10.83

Answer: <https://biology-forums.com/index.php?topic=290783>

### Question 1421

Describe the color changes when sulfur (melting point 113°C, boiling point 445°C) is heated from 25°C to 500°C? It turns from a yellow solid to a

- A) dark reddish brown liquid and then boils.

- B) reddish brown solid and then into reddish brown liquid and then boils.  
C) straw colored liquid which turns dark reddish brown and then it boils.  
D) yellow liquid and then it boils.

Answer: <https://biology-forums.com/index.php?topic=291817>

### Question 1422

If the melting point of titanium metal is 1672°C, what is its melting point in Kelvin?

- A) 897 K  
B) 1399 K  
C) 1945 K  
D) 3042 K

Answer: <https://biology-forums.com/index.php?topic=288748>

### Question 1423

Two aqueous solutions, A and B, are separated by a semipermeable membrane. The osmotic pressure of solution A immediately begins to decrease. Which of the following statements is true?

- A) Solvent molecules are moving from solution B into solution A.  
B) The initial osmotic pressure of solution B is greater than that of solution A.  
C) The solvent molecules are moving from the solution of higher osmotic pressure to that of lower osmotic pressure.  
D) Both B and C are true statements.

Answer: <https://biology-forums.com/index.php?topic=290257>

### Question 1424

How many grams of nickel metal are plated out when a constant current of 15.0 A is passed through aqueous NiCl<sub>2</sub> for 80.0 minutes?

- A) 14.7 g  
B) 21.9 g  
C) 43.8 g  
D) 48.4 g

Answer: <https://biology-forums.com/index.php?topic=291243>

### Question 1425

What is the molarity of a solution prepared by diluting 25 mL of 2.0 M HCl with enough water to make 250 mL of solution?

Answer: <https://biology-forums.com/index.php?topic=289342>

### Question 1426

In which of the following sets do all species have the same number of electrons?

- A) Cl<sup>-</sup>, Ar, Ca<sup>2+</sup>  
B) N, O<sup>2-</sup>, F<sup>-</sup>  
C) Sc<sup>3+</sup>, Y<sup>3+</sup>, La<sup>3+</sup>  
D) Cr, Cr<sup>2+</sup>, Cr<sup>3+</sup>

Answer: <https://biology-forums.com/index.php?topic=288996>

### Question 1427

What is the ground-state electron configuration of tellurium?

- A) [Kr]4d<sup>10</sup>5s<sup>2</sup>5p<sup>4</sup>  
B) [Kr]5s<sup>2</sup>5p<sup>6</sup>5d<sup>8</sup>  
C) [Kr]5s<sup>2</sup>5p<sup>4</sup>  
D) [Kr]4f<sup>14</sup>4d<sup>10</sup>5s<sup>2</sup>5p<sup>4</sup>

Answer: <https://biology-forums.com/index.php?topic=289405>

### Question 1428

What molality of pentane is obtained by dissolving 50.0 g pentane, C<sub>5</sub>H<sub>12</sub>, in 245.0 g hexane, C<sub>6</sub>H<sub>14</sub>?

- A) 0.200 m  
B) 0.240 m  
C) 2.83 m  
D) 200. m

Answer: <https://biology-forums.com/index.php?topic=290220>

### Question 1429



Which of the following is a stronger acid?

- A)  $\text{Cr}^{3+}$
- B)  $\text{Cr}(\text{OH})_2$
- C)  $\text{Cr}(\text{OH})_3$
- D)  $\text{CrO}_2(\text{OH})_2$

Answer: <https://biology-forums.com/index.php?topic=291506>

### Question 1430

What is the  $K_a$  of the amino acid glutamine if it is 33.0% dissociated at  $\text{pH} = 8.82$ ?

Answer: <https://biology-forums.com/index.php?topic=290944>

### Question 1431

One source of titanium is pyrophanite,  $\text{MnTiO}_3$ . The oxidation states of manganese and titanium in pyrophanite are \_\_\_\_\_ and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=291684>

### Question 1432

A fishing boat accidentally spills 6.0 barrels of diesel oil into the ocean. Each barrel contains 42 gallons. If the oil film on the ocean is  $2.5 \times 10^2$  nm thick, how many square meters will the oil slick cover?

- A)  $3.8 \times 10^{-3} \text{ m}^2$
- B)  $3.8 \times 10^6 \text{ m}^2$
- C)  $3.8 \times 10^7 \text{ m}^2$
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=288838>

### Question 1433

Calculate the  $\text{pH}$  of a 0.060 M carbonic acid solution,  $\text{H}_2\text{CO}_3(\text{aq})$ , that has the stepwise dissociation constants  $K_{a1} = 4.3 \times 10^{-7}$  and  $K_{a2} = 5.6 \times 10^{-11}$ .

- A) 1.22
- B) 3.79
- C) 6.37
- D) 10.25

Answer: <https://biology-forums.com/index.php?topic=290776>

### Question 1434

What is the Henderson-Hasselbalch equation for the acidic buffer  $\text{HA}/\text{A}^-$ ?

- A)  $\text{pH} = -\log[\text{H}_3\text{O}^+]$
- B)  $\text{pH} = 14 - \text{pOH}$
- C)  $\text{pH} = \text{p}K_a + \log\left\{\frac{[\text{A}^-]}{[\text{HA}]}\right\}$
- D)  $\text{pH} = \text{p}K_a - \log\left\{\frac{[\text{A}^-]}{[\text{HA}]}\right\}$

Answer: <https://biology-forums.com/index.php?topic=290844>

### Question 1435

What is the molar solubility of  $\text{CaF}_2$  in 0.10 M  $\text{NaF}$  solution at  $25^\circ\text{C}$ ? The  $K_{sp}$  for  $\text{CaF}_2$  is  $3.4 \times 10^{-11}$ .

- A)  $8.5 \times 10^{-10} \text{ M}$
- B)  $3.4 \times 10^{-10} \text{ M}$
- C)  $3.4 \times 10^{-9} \text{ M}$
- D)  $2.0 \times 10^{-4} \text{ M}$

Answer: <https://biology-forums.com/index.php?topic=290871>

### Question 1436

Which is an amino acid basic side chain?

- A)  $-\text{CH}_3$
- B)  $-\text{CH}_2\text{OH}$
- C)  $-\text{CH}_2\text{CO}_2\text{H}$
- D)  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$

Answer: <https://biology-forums.com/index.php?topic=291974>

### Question 1437

What is the geometric shape of the hydrated proton; that is, the hydronium ion  $\text{H}_3\text{O}^+$ ?

- A) angular
- B) trigonal pyramidal
- C) trigonal planar
- D) tetrahedral

Answer: <https://biology-forums.com/index.php?topic=290741>

### Question 1438

A salt bridge is used to

- A) provide reactants in a fuel cell.
- B) determine the direction of the cell reaction.
- C) control whether the cell is electrolytic.
- D) allow the ion flow necessary for cell neutrality.

Answer: <https://biology-forums.com/index.php?topic=291206>

### Question 1439

Which is classified as an ionic binary oxide?

- A)  $\text{BaO}$
- B)  $\text{CO}_2$
- C)  $\text{N}_2\text{O}_5$
- D)  $\text{SO}_3$

Answer: <https://biology-forums.com/index.php?topic=291895>

### Question 1440

Cocaine,  $\text{C}_{17}\text{H}_{21}\text{NO}_4$ , in urine can be confirmed by mass spectroscopy at a concentration of 150 ng/mL. Assuming a urine density of 1.025 g/mL, what is this concentration expressed as molality?

Answer: <https://biology-forums.com/index.php?topic=290331>

### Question 1441

What is the strongest acid among the following?

- A)  $\text{HF}$
- B)  $\text{HCl}$
- C)  $\text{HBr}$
- D)  $\text{HI}$

Answer: <https://biology-forums.com/index.php?topic=290644>

### Question 1442

The sum of the potential and kinetic energies for every molecule or ion in a system is the \_\_\_\_\_ energy of the system and is given the symbol \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289893>

### Question 1443

For an ideal gas, which pairs of variables are inversely proportional to each other (if all other factors remain constant)?

I.  $P, T$  II.  $P, V$  III.  $V, T$  IV.  $n, T$

- A) I and II only
- B) III and IV only
- C) II only
- D) I and III only

Answer: <https://biology-forums.com/index.php?topic=289931>

### Question 1444

The mixing of different gases by random molecular motion with frequent collisions is called

- A) Dalton's law.
- B) compressibility.
- C) diffusion.
- D) effusion.

Answer: <https://biology-forums.com/index.php?topic=290040>

### Question 1445

Human bones found on the west coast of the United States were thought to be remains of a prospector who lived in the 19th century. The bones were subjected to carbon-14 dating. Carbon-14 has a half-life of 5715 years. Living organisms decay at a rate of 15.30 disintegrations per minute per gram of carbon. The bones had a carbon-14 decay rate of 4.660 disintegrations per minute per gram of carbon. To one significant figure the age of the bones is \_\_\_\_\_ years old, so the person \_\_\_\_\_ (did, did not) live in the 19th century.

Answer: <https://biology-forums.com/index.php?topic=291477>

### Question 1446

What are the possible values of  $n$  and  $ml$  for an electron in a 3d orbital?

- A)  $n = 1, 2, \text{ or } 3$  and  $ml = 2$
- B)  $n = 1, 2, \text{ or } 3$  and  $ml = -2, -1, 0, +1, \text{ or } +2$
- C)  $n = 3$  and  $ml = 2$
- D)  $n = 3$  and  $ml = -2, -1, 0, +1, \text{ or } +2$

Answer: <https://biology-forums.com/index.php?topic=289418>

### Question 1447

What is the mole fraction of oxygen in a gas mixture that is 27% oxygen and 73% nitrogen by volume?

- A) 0.24
- B) 0.27
- C) 0.32
- D) 0.37

Answer: <https://biology-forums.com/index.php?topic=290279>

### Question 1448

Which of the following should most favor the solubility of an ionic solid in water?

- A) a low lattice energy for the solid and a low hydration energy for its ions
- B) a low lattice energy for the solid and a high hydration energy for its ions
- C) a high lattice energy for the solid and a low hydration energy for its ions
- D) a high lattice energy for the solid and a high hydration energy for its ions

Answer: <https://biology-forums.com/index.php?topic=290201>

### Question 1449

Which of the compounds,  $\text{Na}_3\text{P}$ ,  $\text{PH}_3$ ,  $\text{C}_2\text{H}_6$ ,  $\text{IBr}_3$ , are ionic compounds?

- A) only  $\text{C}_2\text{H}_6$
- B) only  $\text{Na}_3\text{P}$
- C)  $\text{Na}_3\text{P}$  and  $\text{PH}_3$
- D)  $\text{PH}_3$ ,  $\text{C}_2\text{H}_6$ , and  $\text{IBr}_3$

Answer: <https://biology-forums.com/index.php?topic=289027>

### Question 1450

Carbon-14 has a half-life of 5715 years. Currently living organisms decay at a rate of 15.3 disintegrations/ min per gram of carbon. If an archeological artifact has a carbon-14 decay rate of 12.0 disintegrations/ min per gram of carbon, the approximate age of the artifact is \_\_\_\_\_ years old.

Answer: <https://biology-forums.com/index.php?topic=291476>

### Question 1451

The name of  $\text{H}_2\text{SO}_3$  is

- A) sulfurous acid.
- B) sulfuric acid.
- C) hydrosulfuric acid.
- D) hydrosulfurous acid.

Answer: <https://biology-forums.com/index.php?topic=289239>

### Question 1452

What statement is most inconsistent with the chemistry of transition elements?

- A) Bromide, chloride and iodide stabilize the higher oxidation states of the transition elements.
- B) Early transition metal ions with the metal in its lowest oxidation state are good reducing agents.
- C) Ions that have transition metal in their highest oxidation state tend to be good oxidizing agents.
- D) The stability of the higher oxidation states increases down a periodic group.

Answer: <https://biology-forums.com/index.php?topic=291490>

### Question 1453

When a narrow diameter glass tube is inserted into a body of water, water rises in the tube and its surface inside is concave upwards. Which statement, concerning the strength of the intermolecular forces between glass and water molecules compared to those between water molecules, is accurate?

- A) The forces of attraction between the glass and water are weaker than those in water.
- B) The forces of attraction between the glass and water are stronger than those in water.
- C) The forces of attraction between the glass and water are the same as those in water.
- D) Intermolecular forces are irrelevant to this situation.

Answer: <https://biology-forums.com/index.php?topic=290073>

### Question 1454

Fullerene is an \_\_\_\_\_ of carbon.

Answer: <https://biology-forums.com/index.php?topic=291913>

### Question 1455

If  $K_c = 7.04 \times 10^{-2}$  for the reaction:  $2 \text{HBr(g)} \rightleftharpoons \text{H}_2(\text{g}) + \text{Br}_2(\text{g})$ , what is the value of  $K_c$  for the reaction: ?

- A)  $3.52 \times 10^{-2}$
- B) 0.265
- C) 3.77
- D) 28.4

Answer: <https://biology-forums.com/index.php?topic=290494>

### Question 1456

How many  $\text{H}^+$  ions can the acid,  $\text{H}_2\text{CO}_3$ , donate per molecule?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289234>

### Question 1457

A compound responsible for the odor of garlic has a molecular weight of 146 g/mol. A 0.650 g sample of the compound contains 0.321 g of carbon, 0.044 g of hydrogen, and 0.285 g of sulfur. What is the molecular formula of the compound?

- A)  $\text{CH}_5\text{S}$
- B)  $\text{C}_3\text{H}_5\text{S}$
- C)  $\text{C}_3\text{H}_{15}\text{S}_3$
- D)  $\text{C}_6\text{H}_{10}\text{S}_2$

Answer: <https://biology-forums.com/index.php?topic=289113>

### Question 1458

What is the strongest acid among the following?

- A)  $\text{H}_2\text{O}$
- B)  $\text{H}_2\text{S}$
- C)  $\text{H}_2\text{Se}$
- D)  $\text{H}_2\text{Te}$

Answer: <https://biology-forums.com/index.php?topic=290645>

### Question 1459

Which of the following elements forms the most ionic binary hydride?

- A) Cs
- B) N
- C) Si
- D) Ge

Answer: <https://biology-forums.com/index.php?topic=291858>

### Question 1460

At  $25^\circ\text{C}$  calcium fluoride has a solubility product constant  $K_{sp} = 3.5 \times 10^{-11}$ . The solubility of  $\text{CaF}_2$  at this temperature is \_\_\_\_\_ mol/L.

Answer: <https://biology-forums.com/index.php?topic=290949>

### Question 1461

Which of the following elements is a liquid at room temperature?

- A) neon
- B) helium
- C) mercury
- D) lithium

Answer: <https://biology-forums.com/index.php?topic=288959>

### Question 1462

The electron configuration of an element, X, is  $[\text{Ne}]3s^1$ . The formula of the most probable ionic compound that this element will form with O is

- A) X O
- B)  $\text{X}_2\text{O}_3$
- C)  $\text{X}_2\text{O}$
- D)  $\text{X}_3\text{O}_2$

Answer: <https://biology-forums.com/index.php?topic=289553>

### Question 1463

Using shorthand notation, the ground-state electron configuration for  $\text{Co}^{2+}$  is predicted to be \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289562>

### Question 1464

Which is an ionic binary hydride?

- A) HF
- B) NaH
- C) both HF and NaH
- D) neither HF nor NaH

Answer: <https://biology-forums.com/index.php?topic=291860>

### Question 1465

Nitrogen-14 (14.003074 amu) is synthesized in the sun by fusion of  $^{13}\text{C}$  (13.003355 amu) and  $^1\text{H}$  (1.007825 amu). How much energy is released in this nuclear reaction?

- A)  $2.432 \times 10^6$  kJ/mol
- B)  $7.295 \times 10^8$  kJ/mol
- C)  $9.141 \times 10^{10}$  kJ/mol
- D)  $1.807 \times 10^{11}$  kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291384>

### Question 1466

Elements are classified as metals, nonmetals, or semimetals. At room temperature a certain element exists as a dull yellow solid that is a poor conductor of electricity and is brittle. This element is most likely a \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289045>

### Question 1467

The molecule  $\text{CH}_3\text{CH}_2\text{CO}_2\text{CH}_2\text{CO}_2\text{H}$  contains an \_\_\_\_\_ functional group and a \_\_\_\_\_ functional group.

Answer: <https://biology-forums.com/index.php?topic=292056>

### Question 1468

A buffer solution is prepared by dissolving 27.22 g of  $\text{KH}_2\text{PO}_4$  and 3.37 g of KOH in enough water to make 0.100 L of solution. What is the pH of the  $\text{H}_2\text{PO}_4^-/\text{HPO}_4^{2-}$  buffer if the  $K_{a2} = 6.2 \times 10^{-8}$ ?

- A) 6.84
- B) 7.00
- C) 7.21
- D) 7.84

Answer: <https://biology-forums.com/index.php?topic=290837>

### Question 1469

According to molecular orbital theory, materials with completely filled bands are called

- A) conductors.

- B) metals.
- C) semiconductors.
- D) insulators.

Answer: <https://biology-forums.com/index.php?topic=291634>

### Question 1470

How long must a constant current of 50.0 A be passed through an electrolytic cell containing aqueous  $\text{Cu}^{2+}$  ions to produce 3.50 moles of copper metal?

- A) 0.267 hours
- B) 0.533 hours
- C) 1.88 hours
- D) 3.75 hours

Answer: <https://biology-forums.com/index.php?topic=291244>

### Question 1471

Which name is not correct?

- A) 1, 1-dimethylcyclopentane
- B) 1, 2-dimethylcyclopentane
- C) 1, 3-dimethylcyclooctane
- D) 1, 4-dimethylcyclopentane

Answer: <https://biology-forums.com/index.php?topic=292013>

### Question 1472

The law of conservation of energy is also known as the \_\_\_\_\_ law of thermodynamics.

Answer: <https://biology-forums.com/index.php?topic=289886>

### Question 1473

Which statement below is not true?

- A) The cell reactants in a fuel cell are continuously supplied from an external source.
- B) A fuel cell is a galvanic cell.
- C) Modern fuel cells can be easily regenerated using household current.
- D) One of the reactants in a fuel cell is a traditional fuel.

Answer: <https://biology-forums.com/index.php?topic=291150>

### Question 1474

Which of the following ions should be the strongest reducing agent?

- A)  $\text{V}^{3+}$
- B)  $\text{Cr}^{3+}$
- C)  $\text{Fe}^{3+}$
- D)  $\text{Co}^{3+}$

Answer: <https://biology-forums.com/index.php?topic=291494>

### Question 1475

Which chromium species exists only under acidic conditions?

- A)  $\text{Cr}(\text{OH})_2$
- B)  $\text{Cr}(\text{OH})_4^-$
- C)  $\text{CrO}_4^{2-}$
- D)  $\text{Cr}_2\text{O}_7^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291498>

### Question 1476

From the following list of observations, choose the one that most clearly supports the following conclusion by de Broglie: "Electrons have wave properties."

- A) Line emission spectrum of hydrogen
- B) The photoelectric effect
- C) Xray diffraction
- D) Sodium chloride produces sodium solid and chlorine gas

Answer: <https://biology-forums.com/index.php?topic=289377>

### Question 1477

Determine the direction of electron flow and the direction of ion flow.

- A) Electrons flow from a to c; K<sup>+</sup> ions flow toward a and Cl<sup>-</sup> ions flow toward c.
- B) Electrons flow from a to c; Cl<sup>-</sup> ions flow toward a and K<sup>+</sup> ions flow toward c.
- C) Electrons flow from c to a; K<sup>+</sup> ions flow toward a and Cl<sup>-</sup> ions flow toward c.
- D) Electrons flow from c to a; Cl<sup>-</sup> ions flow toward a and K<sup>+</sup> ions flow toward c.

Answer: <https://biology-forums.com/index.php?topic=291188>

### Question 1478

Arrange the following in order of increasing ionic character: Al<sub>2</sub>S<sub>3</sub>, MgS, Na<sub>2</sub>S, P<sub>4</sub>S<sub>3</sub>, S<sub>8</sub>.

- A) MgS, Na<sub>2</sub>S, Al<sub>2</sub>S<sub>3</sub>, P<sub>4</sub>S<sub>3</sub>, S<sub>8</sub>
- B) Na<sub>2</sub>S, MgS, Al<sub>2</sub>S<sub>3</sub>, P<sub>4</sub>S<sub>3</sub>, S<sub>8</sub>
- C) S<sub>8</sub>, P<sub>4</sub>S<sub>3</sub>, Al<sub>2</sub>S<sub>3</sub>, MgS, Na<sub>2</sub>S
- D) S<sub>8</sub>, P<sub>4</sub>S<sub>3</sub>, Al<sub>2</sub>S<sub>3</sub>, Na<sub>2</sub>S, MgS

Answer: <https://biology-forums.com/index.php?topic=289601>

### Question 1479

Combustion analysis of 0.150 g of an unknown compound containing carbon, hydrogen, and oxygen produced 0.2607 g of CO<sub>2</sub> and 0.1418 g of H<sub>2</sub>O. What is the empirical formula of the compound?

- A) C<sub>2</sub>H<sub>5</sub>O
- B) C<sub>2</sub>H<sub>5</sub>O<sub>2</sub>
- C) C<sub>2</sub>H<sub>10</sub>O<sub>3</sub>
- D) C<sub>3</sub>H<sub>8</sub>O<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289185>

### Question 1480

Which ending on a ketone or aldehyde indicates a sugar?

- A) -ene
- B) -one
- C) ether
- D) -ose

Answer: <https://biology-forums.com/index.php?topic=292015>

### Question 1481

Calculate the molar solubility of thallium(I) chloride in 0.20 M NaCl at 25°C. K<sub>sp</sub> for TlCl is 1.7 × 10<sup>-4</sup>.

- A) 3.4 × 10<sup>-5</sup> M
- B) 8.5 × 10<sup>-4</sup> M
- C) 5.8 × 10<sup>-3</sup> M
- D) 1.3 × 10<sup>-2</sup> M

Answer: <https://biology-forums.com/index.php?topic=290921>

### Question 1482

Which one of the following metals is expected to have the highest melting point?

- A) Au
- B) Fe
- C) Hg
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291674>

### Question 1483

At what temperature will sulfur hexafluoride molecules have the same average speed as argon atoms at 20°C?

- A) -22.0°C
- B) 73.2°C
- C) 381°C
- D) 799°C

Answer: <https://biology-forums.com/index.php?topic=289970>

### Question 1484

For a liquid solution made by dissolving a solid or a gas in a liquid, the

- A) liquid is the solute.
- B) liquid is the solvent.
- C) solute is the component present in the greatest amount.
- D) solvent is the component present in the greatest amount.

Answer: <https://biology-forums.com/index.php?topic=290187>

### Question 1485

In general, as the temperature increases, the solubility of gases in water \_\_\_\_\_ and the solubility of most solids in water \_\_\_\_\_.

- A) decreases, decreases
- B) decreases, increases
- C) increases, decreases
- D) increases, increases

Answer: <https://biology-forums.com/index.php?topic=290235>

### Question 1486

The principal source of chromium is chromite. What is the formula of chromite?

Answer: <https://biology-forums.com/index.php?topic=291685>

### Question 1487

A solution is made by dissolving 19.5 g of sucrose, C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>, in 117 g of water, producing a solution with a volume of 125 mL at 20°C. What is the expected osmotic pressure at 20°C?

- A) 11.0 atm
- B) 23.2 atm
- C) 50.0 atm
- D) 58 atm

Answer: <https://biology-forums.com/index.php?topic=290322>

### Question 1488

A::A represents

- A) a double bond.
- B) a quadruple bond.
- C) one lone pair of electrons.
- D) two lone pairs of electrons.

Answer: <https://biology-forums.com/index.php?topic=289605>

### Question 1489

Each molecule of cortisone contains 21 atoms of carbon (plus other atoms). The mass percentage of carbon in cortisone is 69.98%. What is the molar mass of cortisone?

- A) 176.5 g/mol
- B) 252.2 g/mol
- C) 287.6 g/mol
- D) 360.4 g/mol

Answer: <https://biology-forums.com/index.php?topic=289121>

### Question 1490

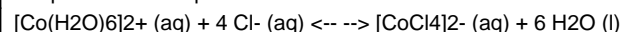
How many grams of chromium metal are plated out when a constant current of 8.00 A is passed through an aqueous solution containing Cr<sup>3+</sup> ions for 40.0 minutes?

- A) 3.45 g
- B) 6.15 g
- C) 10.3 g
- D) 31.0 g

Answer: <https://biology-forums.com/index.php?topic=291170>

### Question 1491

The pink and blue species below form a violet colored mixture at equilibrium:



(pink) (blue)

If the concentration of [Co(H<sub>2</sub>O)<sub>6</sub>]<sup>2+</sup> is increased, what happens to the solution?

- A) The concentration of [CoCl<sub>4</sub>]<sup>2-</sup> increases.



- B) The concentration of  $[\text{CoCl}_4]^{2-}$  decreases.  
C) The solution becomes colorless.  
D) No color change is observed.

Answer: <https://biology-forums.com/index.php?topic=290552>

### Question 1492

A sample of pure lithium carbonate contains 18.8% lithium by mass. What is the % lithium by mass in a sample of pure lithium carbonate that has twice the mass of the first sample?

- A) 9.40%  
B) 18.8%  
C) 37.6%  
D) 75.2%

Answer: <https://biology-forums.com/index.php?topic=288880>

### Question 1493

Calculate the pH of a 0.100 M  $\text{NaCH}_3\text{CO}_2$  solution.  $K_a$  for acetic acid,  $\text{CH}_3\text{CO}_2\text{H}$ , is  $1.8 \times 10^{-5}$ .

- A) 2.87  
B) 5.13  
C) 8.87  
D) 11.13

Answer: <https://biology-forums.com/index.php?topic=290716>

### Question 1494

Classify bonds in  $\text{As}_4$  as largely ionic, nonpolar covalent, or polar covalent.

Answer: <https://biology-forums.com/index.php?topic=289650>

### Question 1495

Which elements of group 6A are oxidizing agents and which are reducing agents?

- A) O and S are oxidizing agents while Se and Te are reducing agents.  
B) O and Se are oxidizing agents while S and Te are reducing agents.  
C) O and S are reducing agents while Se and Te are oxidizing agents.  
D) O and Se are reducing agents while S and Te are reducing agents.

Answer: <https://biology-forums.com/index.php?topic=291800>

### Question 1496

If the ionization constant of water,  $K_w$ , at  $40^\circ\text{C}$  is  $2.92 \times 10^{-14}$ , then what is the hydronium ion concentration for a neutral solution?

- A)  $[\text{H}_3\text{O}^+] < 1.00 \times 10^{-7} \text{ M}$   
B)  $[\text{H}_3\text{O}^+] > 1.71 \times 10^{-7} \text{ M}$   
C)  $[\text{H}_3\text{O}^+] = 1.71 \times 10^{-7} \text{ M}$   
D)  $[\text{H}_3\text{O}^+] < 1.71 \times 10^{-7} \text{ M}$

Answer: <https://biology-forums.com/index.php?topic=290655>

### Question 1497

According to the Bohr model, when a hydrogen electron makes a transition from  $n=4$  to  $n=2$ , which of the following statements is true?

- I. Energy is emitted.  
II. Energy is absorbed.  
III. Electrons lose energy.  
IV. Electrons gain energy.

- A) I only  
B) I and III  
C) I and IV  
D) II and IV

Answer: <https://biology-forums.com/index.php?topic=289373>

### Question 1498

Ethane is an example of

- A) a compound.  
B) an element.  
C) a mixture.  
D) a cation.

Answer: <https://biology-forums.com/index.php?topic=288992>

### Question 1499

The equilibrium constant,  $K_p$ , equals 3.40 for the isomerization reaction:  
 $\text{cis-2-butene} \rightleftharpoons \text{trans-2-butene}$ .

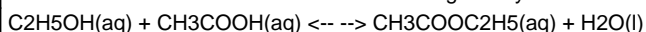
If a flask initially contains 0.250 atm of cis-2-butene and 0.125 atm of trans-2-butene, what is the equilibrium pressure of each gas?

- A)  $P(\text{cis-2-butene}) = 0.037 \text{ atm}$ ,  $P(\text{trans-2-butene}) = 0.125 \text{ atm}$
- B)  $P(\text{cis-2-butene}) = 0.048 \text{ atm}$ ,  $P(\text{trans-2-butene}) = 0.165 \text{ atm}$
- C)  $P(\text{cis-2-butene}) = 0.074 \text{ atm}$ ,  $P(\text{trans-2-butene}) = 0.250 \text{ atm}$
- D)  $P(\text{cis-2-butene}) = 0.085 \text{ atm}$ ,  $P(\text{trans-2-butene}) = 0.290 \text{ atm}$

Answer: <https://biology-forums.com/index.php?topic=290539>

### Question 1500

The esterification of acetic acid and ethanol is given by the reaction below:



When 1.00 mol of ethanol was mixed with 2.00 mol of acid in a 1.00 L flask, 0.86 mol of ester was formed at room temperature. What is the value of the equilibrium constant,  $K_c$ ?

- A) 0.43
- B) 2.3
- C) 4.6
- D) 5.4

Answer: <https://biology-forums.com/index.php?topic=290541>

### Question 1501

The smallest sample of carbon atoms that can be observed with the naked eye has a mass of approximately  $2 \times 10^{-8} \text{ g}$ . Given that  $1 \text{ g} = 6.02 \times 10^{23} \text{ amu}$ , and that carbon has an atomic weight of 12.01 amu, determine the number of carbon atoms present in the sample.

- A)  $1 \times 10^{15}$
- B)  $1 \times 10^{16}$
- C)  $1 \times 10^{17}$
- D)  $6 \times 10^{23}$

Answer: <https://biology-forums.com/index.php?topic=288905>

### Question 1502

Calculate the molality of a solution with 53 grams of KCl in 2000 mL of water. (density of water is 1.00 g/mL).

- A) 0.027
- B) 0.27
- C) 0.00071
- D) 0.0027

Answer: <https://biology-forums.com/index.php?topic=290301>

### Question 1503

A becquerel is

- A) the amount of sample that undergoes 1 disintegration per second.
- B) the amount of sample that undergoes  $3.7 \times 10^{10}$  disintegrations per second.
- C) the amount of tissue damage done by radiation.
- D) equal to 0.01 J of energy absorbed per kilogram of tissue.

Answer: <https://biology-forums.com/index.php?topic=291396>

### Question 1504

What is the pH of a solution made by mixing 30.00 mL of 0.10 M acetic acid with 45.00 mL of 0.100 M KOH? Assume that the volumes of the solutions are additive.  $K_a = 1.8 \times 10^{-5}$  for  $\text{CH}_3\text{CO}_2\text{H}$ .

- A) 8.26
- B) 9.26
- C) 11.13
- D) 12.30

Answer: <https://biology-forums.com/index.php?topic=290910>

### Question 1505

What is the approximate pH at the equivalence point of a weak acid-strong base titration if 25 mL of aqueous formic acid requires 29.80 mL of 0.0567 M NaOH?  $K_a = 1.8 \times 10^{-4}$  for formic acid.

- A) 2.46
- B) 5.88
- C) 8.12
- D) 11.54

Answer: <https://biology-forums.com/index.php?topic=290855>

### Question 1506

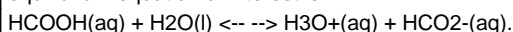
Which of the following molecules does not have a dipole moment?

- A)  $\text{CBr}_2=\text{CBr}_2$
- B)  $\text{NCl}_3$
- C)  $\text{CH}_3\text{NH}_2$
- D)  $\text{HCl}$

Answer: <https://biology-forums.com/index.php?topic=289741>

### Question 1507

Determine the acid dissociation constant for a 0.020 M formic acid solution that has a pH of 2.74. Formic acid is a weak monoprotic acid and the equilibrium equation of interest is



- A)  $1.8 \times 10^{-3}$
- B)  $1.8 \times 10^{-4}$
- C)  $3.6 \times 10^{-4}$
- D)  $3.6 \times 10^{-5}$

Answer: <https://biology-forums.com/index.php?topic=290683>

### Question 1508

In which set do all elements tend to form cations in binary ionic compounds?

- A) Na, B, S
- B) Ca, Cr, Pb
- C) S, As, Bi
- D) O, Br, I

Answer: <https://biology-forums.com/index.php?topic=289020>

### Question 1509

Which set of ions precipitate as sulfides?

- A)  $\text{Ag}^+$ ,  $\text{Pb}^{2+}$ ,  $\text{Mn}^{2+}$
- B)  $\text{Pb}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Ca}^{2+}$
- C)  $\text{Co}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{K}^+$
- D)  $\text{NH}_4^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$

Answer: <https://biology-forums.com/index.php?topic=290930>

### Question 1510

The reaction  $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{O}_2(\text{g})$  is endothermic 298 K. The effect of increasing the total volume of the system at equilibrium will \_\_\_\_\_ (decrease, increase, have no effect on) the total quantity of  $\text{CaCO}_3$  once equilibrium is reestablished.

Answer: <https://biology-forums.com/index.php?topic=290623>

### Question 1511

Which one of the following amino acids contains a polar side chain?

- A) alanine
- B) glycine
- C) serine
- D) histidine

Answer: <https://biology-forums.com/index.php?topic=292034>

### Question 1512

The element in group 7A with the least favorable (least negative) electron affinity is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289577>

### Question 1513

Calculate the pH for an aqueous solution of pyridine that contains \_\_\_\_\_ hydroxide ion.

- A)  $2.41 \times 10^{-11}$
- B)  $4.15 \times 10^{-4}$
- C) 3.38
- D) 10.62

Answer: <https://biology-forums.com/index.php?topic=290755>

### Question 1514

Which of the following can function as a bidentate ligand?

- A) NO +
- B) Cl -
- C) S CN -
- D) H<sub>2</sub>NCH<sub>2</sub>CO<sub>2</sub> -

Answer: <https://biology-forums.com/index.php?topic=291565>

### Question 1515

Which of the following is an exact number?

- A) 0.0.369 grams
- B) 9.25 liters
- C) 4 oranges
- D) 3.60°C

Answer: <https://biology-forums.com/index.php?topic=288827>

### Question 1516

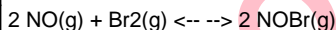
Sodium hydroxide is available commercially as a 50.0% by weight aqueous solution. The density of the solution is 1.53 g/mL. Calculate the molarity of this sodium hydroxide solution.

- A) 0.450 M
- B) 19.1 M
- C) 25.0 M
- D) 125. M

Answer: <https://biology-forums.com/index.php?topic=290226>

### Question 1517

A 1.50 L vessel contains an equilibrium mixture of 0.100 mol of NO, 0.150 mol of Br<sub>2</sub>, and 0.250 mol of NOBr at 25°C. What is the value of K<sub>p</sub> for the reaction below?



- A) 2.56
- B) 62.5
- C)  $1.28 \times 10^2$
- D)  $1.53 \times 10^3$

Answer: <https://biology-forums.com/index.php?topic=290510>

### Question 1518

Coinage metals are metals that are not easily oxidized. Based on the activity series, which metal would be least desirable as a coinage metal?

- A) Mn
- B) Au
- C) Ca
- D) Co

Answer: <https://biology-forums.com/index.php?topic=289330>

### Question 1519

What electron geometry would you expect for atoms that have 6 charge clouds?

- A) Tetrahedral
- B) Octahedral
- C) Trigonal planar
- D) Trigonal bipyramid

Answer: <https://biology-forums.com/index.php?topic=289732>

### Question 1520

What is the chemical formula for radium hydride?

- A) RaH<sub>2</sub>

- B) RaOH
- C) RaOH<sub>2</sub>
- D) Ra(OH)<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289012>

### Question 1521

Which of the following regions of the earth's atmosphere is closest to the surface of the earth?

- A) mesosphere
- B) stratosphere
- C) thermosphere
- D) troposphere

Answer: <https://biology-forums.com/index.php?topic=289981>

### Question 1522

The symbol for mercury is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289039>

### Question 1523

The number of different monochloro substitution products (C<sub>5</sub>H<sub>11</sub>Cl) that can form from the reaction of 2,2-dimethylpropane with Cl<sub>2</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292050>

### Question 1524

Which element of group 5A has the highest melting point?

- A) nitrogen
- B) white phosphorus
- C) antimony
- D) bismuth

Answer: <https://biology-forums.com/index.php?topic=291780>

### Question 1525

A neutral N atom has how many valence electrons?

- A) 1
- B) 3
- C) 6
- D) 14

Answer: <https://biology-forums.com/index.php?topic=289445>

### Question 1526

How many electrons are in the ion, CO<sub>3</sub><sup>2-</sup>?

- A) 16
- B) 28
- C) 30
- D) 32

Answer: <https://biology-forums.com/index.php?topic=288914>

### Question 1527

Which of the following species cannot act as a Lewis base?

- A) O<sup>2-</sup>
- B) CH<sub>4</sub>
- C) H<sub>2</sub>O
- D) NH<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290724>

### Question 1528

At 1000 K, K<sub>p</sub> = 19.9 for the reaction Fe<sub>2</sub>O<sub>3</sub>(s) + 3 CO(g)  $\rightleftharpoons$  2 Fe(s) + 3 CO<sub>2</sub>(g). What is the value of K<sub>p</sub> for the reaction 8 Fe(s) + 12 CO<sub>2</sub>(g)  $\rightleftharpoons$  4 Fe<sub>2</sub>O<sub>3</sub>(s) + 12 CO(g)?

Answer: <https://biology-forums.com/index.php?topic=290611>

### Question 1529

In order for the reaction  $A^- + H_2CO_3 \rightleftharpoons HA + HCO_3^-$  to have an equilibrium constant  $K_c < 1$ , the  $K_a$  of HA must be \_\_\_\_\_ (greater, less) than the  $K_a$  of  $H_2CO_3$ .

Answer: <https://biology-forums.com/index.php?topic=290816>

### Question 1530

At an atmospheric pressure of 745 mm Hg, what is the pressure of He gas inside a cylinder that is attached to an open-end manometer in which the level of mercury in the open side of the manometer is 25 mm Hg higher than the side that is attached to the gas cylinder?

Answer: <https://biology-forums.com/index.php?topic=290049>

### Question 1531

What is the element symbol for an atom that has 33 protons and 41 neutrons?

- A) As
- B) Nb
- C) O
- D) W

Answer: <https://biology-forums.com/index.php?topic=288975>

### Question 1532

Combustion analysis of a 0.675 g sample of an unknown compound that contains only carbon, hydrogen, and oxygen gives 0.627 g of  $CO_2$  and 1.534 g of  $H_2O$ . The molecular mass of the unknown is

- A)  $C_3H_6O$ .
- B)  $C_6H_{12}O_2$ .
- C)  $C_9H_{18}O_3$ .
- D) unable to be determined from this data.

Answer: <https://biology-forums.com/index.php?topic=289118>

### Question 1533

If the reaction of phosphate ion with water is ignored, what is the total concentration of ions in a solution prepared by dissolving 7.00 g of  $K_3PO_4$  in enough water to make 350. mL of solution?

- A) 0.0236 M
- B) 0.0943 M
- C) 0.377 M
- D) 0.754 M

Answer: <https://biology-forums.com/index.php?topic=289288>

### Question 1534

What is the entropy of 50 molecules in a system of 1000 boxes?

Answer: <https://biology-forums.com/index.php?topic=291055>

### Question 1535

Concentrations of fluoride in drinking water greater than 4.0 mg/L can cause mottled teeth in children. What is 4.0 mg/L expressed as molality?

Answer: <https://biology-forums.com/index.php?topic=290332>

### Question 1536

A particular superconductor has eight copper atoms on corners and eight copper atoms on edges of its unit cell. How many copper atoms are attributed to a single unit cell of this superconductor?

- A) 1
- B) 3
- C) 5
- D) 16

Answer: <https://biology-forums.com/index.php?topic=291638>

### Question 1537

What is the density of chlorine gas at STP?

- A) 0.316 g/L
- B) 1.58 g/L
- C) 2.90 g/L
- D) 3.16 g/L

Answer: <https://biology-forums.com/index.php?topic=290013>

### Question 1538

The smallest alkyne is called

- A) ethene.
- B) propene.
- C) 1-butyne.
- D) acetylene.

Answer: <https://biology-forums.com/index.php?topic=292011>

### Question 1539

A mass of mercury occupies 0.650 L. What volume would an equal mass of ethanol occupy? The density of mercury is 13.6 g/mL and the density of ethanol is 0.789 g/mL.

- A) 0.0378 L
- B) 0.650 L
- C) 11.2 L
- D) 5.00 L

Answer: <https://biology-forums.com/index.php?topic=288818>

### Question 1540

Which of the following has the smallest mass?

- A)  $6.02 \times 10^{23}$  molecules of  $I_2$
- B) 70.0 g of  $Cl_2$
- C) 2.00 mol of  $F_2$
- D) 0.040 kg of  $Br_2$

Answer: <https://biology-forums.com/index.php?topic=289093>

### Question 1541

The number of moles of ions in 35.0mL of 4.00 M  $Na_2SO_4$  is \_\_\_\_\_ moles.

Answer: <https://biology-forums.com/index.php?topic=290329>

### Question 1542

At 1 atm pressure the heat of sublimation of gallium is 277 kJ/mol and the heat of vaporization is 271 kJ/mol. How much heat is required to melt 0.500 mol of gallium at 1.00 atm pressure?

- A) 6.00 kJ
- B) 3.00 kJ
- C) 268 kJ
- D) 271 kJ

Answer: <https://biology-forums.com/index.php?topic=289800>

### Question 1543

Consider a bimolecular reaction in the gas phase. Which one of the following changes in condition will not cause an increase in the rate of the reaction?

- A) add a catalyst
- B) increase the temperature at constant volume
- C) increase the volume at constant temperature
- D) All of these will increase the rate of reaction.

Answer: <https://biology-forums.com/index.php?topic=290394>

### Question 1544

How many moles are there in 4.00 g of ethanol,  $CH_3CH_2OH$ ?

- A) 0.00543 mol
- B) 0.0870 mol
- C) 11.5 mol
- D) 184 mol

Answer: <https://biology-forums.com/index.php?topic=289132>

### Question 1545

Which one of the following salts, when dissolved in water, produces the solution with a pH closest to 7.00?

- A)  $NH_4Cl$

- B) BaO
- C) NaHSO<sub>4</sub>
- D) RbI

Answer: <https://biology-forums.com/index.php?topic=290715>

### Question 1546

The nutritional calorie (abbreviated Cal) is equal to

- A) 1 mcal.
- B) 4.184 J.
- C) 4.184 Mcal.
- D) 1 kcal.

Answer: <https://biology-forums.com/index.php?topic=288820>

### Question 1547

Which of the following species is diamagnetic?

- A) an isolated, gas-phase V<sup>3+</sup> ion
- B) a high-spin octahedral Fe<sup>2+</sup> complex
- C) an isolated, gas-phase Cu<sup>2+</sup> ion
- D) a low-spin octahedral Co<sup>3+</sup> complex

Answer: <https://biology-forums.com/index.php?topic=291519>

### Question 1548

An international group of zookeepers with successful breeding programs made the following animal exchanges last year. Using the same bartering system, how many oryxes can a zoo obtain in exchange for 15 flamingos?

- 3 oryxes = 1 tiger    2 flamingos = 1 anteater
- 1 camel = 6 anteaters    5 lemurs = 1 rhino
- 1 rhino = 4 monkeys    3 lemurs = 1 camel
- 3 monkeys = 1 tiger    1 rhino = 4 oryxes

- A) one oryx
- B) three oryxes
- C) four oryxes
- D) five oryxes

Answer: <https://biology-forums.com/index.php?topic=288772>

### Question 1549

Elements that can accommodate more than eight electrons in their valence shell occur only in periodic table row

- A) 2 or lower.
- B) 3 or lower.
- C) 4 or lower.
- D) 5 or lower.

Answer: <https://biology-forums.com/index.php?topic=289610>

### Question 1550

Calculate the pH of a 0.020 M carbonic acid solution, H<sub>2</sub>CO<sub>3</sub>(aq), that has the stepwise dissociation constants  $K_{a1} = 4.3 \times 10^{-7}$  and  $K_{a2} = 5.6 \times 10^{-11}$ .

- A) 1.70
- B) 4.03
- C) 6.37
- D) 10.25

Answer: <https://biology-forums.com/index.php?topic=290697>

### Question 1551

The two most efficiently packed unit cells have the hexagonal closest-packed and the \_\_\_\_\_ the atomic arrangements.

Answer: <https://biology-forums.com/index.php?topic=290178>

### Question 1552

Of the following, which element has the highest first ionization energy?

- A) In
- B) I
- C) Rb

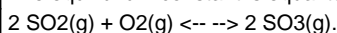


D) Sb

Answer: <https://biology-forums.com/index.php?topic=289534>

### Question 1553

The equilibrium constant is equal to 5.00 at 1300 K for the reaction:



If initial concentrations are  $[\text{SO}_2] = 3.60 \text{ M}$ ,  $[\text{O}_2] = 0.45 \text{ M}$ , and  $[\text{SO}_3] = 5.40 \text{ M}$ , the system is

- A) at equilibrium.
- B) not at equilibrium and will remain in an unequilibrated state.
- C) not at equilibrium and will shift to the left to achieve an equilibrium state.
- D) not at equilibrium and will shift to the right to achieve an equilibrium state.

Answer: <https://biology-forums.com/index.php?topic=290575>

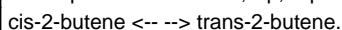
### Question 1554

A certain metal can exist in two different cubic cells, body-centered and face-centered cubic. Which unit cell will have the greater density?

Answer: <https://biology-forums.com/index.php?topic=290181>

### Question 1555

The equilibrium constant,  $K_p$ , equals 3.40 at 25°C for the isomerization reaction:



If a flask initially contains 3.00 atm of each gas, in what direction will the system shift to reach equilibrium?

- A) It will shift left.
- B) It will shift right.
- C) The system is already at equilibrium.
- D) The system is not at equilibrium and will remain in an unequilibrated state.

Answer: <https://biology-forums.com/index.php?topic=290576>

### Question 1556

The density of mercury is 13.5 g/mL. What is the mass in kg of mercury that fills a 0.250 L flask?

- A) 0.0540 kg
- B) 3.38 kg
- C) 54.0 kg
- D) 3380 kg

Answer: <https://biology-forums.com/index.php?topic=288757>

### Question 1557

Benzene has a formula of

- A) C<sub>3</sub>H<sub>8</sub>.
- B) C<sub>6</sub>H<sub>10</sub>.
- C) C<sub>6</sub>H<sub>6</sub>.
- D) C<sub>8</sub>H<sub>16</sub>.

Answer: <https://biology-forums.com/index.php?topic=291987>

### Question 1558

The H-C-H bond angles in C<sub>2</sub>H<sub>6</sub>, C<sub>2</sub>H<sub>4</sub>, and C<sub>2</sub>H<sub>2</sub> are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=292044>

### Question 1559

Which of the following elements is a liquid at room temperature?

- A) fluorine
- B) chlorine
- C) bromine
- D) iodine

Answer: <https://biology-forums.com/index.php?topic=291822>

### Question 1560

One mole of which gas has the greatest density at STP?

- A) Kr
- B) CO<sub>2</sub>

- C) Ar  
D) All three gases have the same density.

Answer: <https://biology-forums.com/index.php?topic=290019>

### Question 1561

Which one of the amino acids contains a double ring structure?

- A) alanine  
B) serine  
C) tryptophan  
D) histidine

Answer: <https://biology-forums.com/index.php?topic=292036>

### Question 1562

\_\_\_\_\_ is a nonmetal that is a solid at room temperature.

- A) Calcium  
B) Selenium  
C) Bromine  
D) Copper

Answer: <https://biology-forums.com/index.php?topic=288944>

### Question 1563

The oxidation number of sulfur in  $S O_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291926>

### Question 1564

Elements A and Q form two compounds, AQ and  $A_2Q_3$ . The mass ratio (mass Q)/(mass A) for AQ is 0.286. What is the mass ratio (mass Q)/(mass A) for  $A_2Q_3$ ?

- A) 0.191  
B) 0.429  
C) 2.33  
D) 5.24

Answer: <https://biology-forums.com/index.php?topic=288970>

### Question 1565

The fundamental SI unit of mass is the \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=288848>

### Question 1566

The observation that hydrogen and oxygen can react to form two compounds with different chemical and physical properties, one having an O:H mass ratio = 8:1 and the other having an O:H mass ratio = 16:1 is consistent with the law of

- A) definite proportions.  
B) energy conservation.  
C) mass conservation.  
D) multiple proportions.

Answer: <https://biology-forums.com/index.php?topic=288882>

### Question 1567

Which group 3A element has the highest electronegativity?

- A) B  
B) Al  
C) Ga  
D) Si

Answer: <https://biology-forums.com/index.php?topic=291873>

### Question 1568

Which of the following aqueous salt (NaCl) solutions has the greater concentration?

- A) 0.5 M  
B) 2.3 m  
C) 3.0 % by mass

D) 11.1 g/L

Answer: <https://biology-forums.com/index.php?topic=290233>

### Question 1569

An electron in an oxygen p orbital on which of the following would have the highest entropy?

- A) CH<sub>3</sub>CH<sub>2</sub>OH
- B) CH<sub>3</sub>CH<sub>2</sub>O<sup>-</sup>
- C) CH<sub>3</sub>CO<sub>2</sub>OH
- D) CH<sub>3</sub>CO<sub>2</sub><sup>-</sup>

Answer: <https://biology-forums.com/index.php?topic=290966>

### Question 1570

Of the following, which atom has the largest atomic radius?

- A) V
- B) Ni
- C) Sc
- D) Br

Answer: <https://biology-forums.com/index.php?topic=289447>

### Question 1571

Iodine, I<sub>2</sub>(s), is more soluble in dichloromethane, CH<sub>2</sub>Cl<sub>2</sub>(l), than in water because

- A) both iodine and dichloromethane have strong ion-dipole interactions.
- B) the dipole-dipole forces in dichloromethane are much stronger than the dispersion forces in iodine.
- C) the intermolecular forces are similar in both iodine and dichloromethane.
- D) iodine is polar and dichloromethane has a large number of hydrogen bonds.

Answer: <https://biology-forums.com/index.php?topic=290188>

### Question 1572

How many valence electrons does the element Co have?

- A) 1
- B) 10
- C) 12
- D) 9

Answer: <https://biology-forums.com/index.php?topic=291552>

### Question 1573

Which of the following elements is an inner transition metal?

- A) No
- B) Ni
- C) Ne
- D) Na

Answer: <https://biology-forums.com/index.php?topic=291545>

### Question 1574

The ratio of <sup>238</sup>U to <sup>206</sup>Pb is used to date old mineral samples. Each 1.000 g of <sup>238</sup>U that decays eventually produces 0.866 g of <sup>206</sup>Pb. If the half-life of <sup>238</sup>U is  $4.468 \times 10^9$  years, what is the age of a mineral that has a <sup>238</sup>U/<sup>206</sup>Pb mass ratio of 2.00?

- A)  $2.94 \times 10^9$  years
- B)  $3.60 \times 10^9$  years
- C)  $3.87 \times 10^9$  years
- D)  $4.47 \times 10^9$  years

Answer: <https://biology-forums.com/index.php?topic=291413>

### Question 1575

Which of the following does not affect the rate of a bimolecular reaction?

- A) concentrations of reactants
- B) presence of a catalyst
- C) temperature
- D) All of these affect the rate.

Answer: <https://biology-forums.com/index.php?topic=290413>

### Question 1576

You are given two flasks of equal volume. One contains H<sub>2</sub> at 0°C and 1 atm while the other contains CO<sub>2</sub> at \_\_\_\_\_ and 2 atm. Which of the following quantities will be the same for both flasks?

- A) average molecular kinetic energy
- B) average molecular speed
- C) density
- D) number of molecules present

Answer: <https://biology-forums.com/index.php?topic=289971>

### Question 1577

Which of the following species has its N atom or atoms in the -1 oxidation state?

- A) N<sub>2</sub>H<sub>4</sub>
- B) NH<sub>2</sub>OH
- C) N<sub>2</sub>O
- D) HONO

Answer: <https://biology-forums.com/index.php?topic=291779>

### Question 1578

Which statement about real gases is true?

- A) The volume of the gas particles is zero.
- B) The mass of the gas particles is zero.
- C) Forces of attraction and repulsion exist between gas particles at close range.
- D) The behavior of real gases can be exactly predicted using the ideal gas law.

Answer: <https://biology-forums.com/index.php?topic=289978>

### Question 1579

There are three isotopes of oxygen 16O, 17O and 18O. Indicate the number of different types of isotopically substituted diatomic oxygen.

- A) 3
- B) 5
- C) 6
- D) 9

Answer: <https://biology-forums.com/index.php?topic=291802>

### Question 1580

Phenobarbital has a pK<sub>a</sub> = 7.4. Compared to a 1.0 × 10<sup>-3</sup> M solution, 1.0 × 10<sup>-4</sup> M phenobarbital will have a \_\_\_\_\_ (higher, lower) pH and a \_\_\_\_\_ (higher, lower) percent ionization.

Answer: <https://biology-forums.com/index.php?topic=290819>

### Question 1581

Ammonia NH<sub>3</sub>, has a base dissociation constant of 1.8 × 10<sup>-5</sup>. What is the conjugate acid of ammonia and what is its acid dissociation constant?

- A) NH<sub>4</sub><sup>+</sup>, 1.9 × 10<sup>9</sup>
- B) NH<sub>4</sub><sup>+</sup>, 1.8 × 10<sup>-5</sup>
- C) NH<sub>4</sub><sup>+</sup>, 5.6 × 10<sup>-10</sup>
- D) NH<sub>2</sub><sup>-</sup>, 5.6 × 10<sup>-10</sup>

Answer: <https://biology-forums.com/index.php?topic=290708>

### Question 1582

In liquid pentanol, CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>, which intermolecular forces are present?

- A) Dispersion, hydrogen bonding and dipole-dipole forces are present.
- B) Only dipole-dipole and ion-dipole forces are present.
- C) Only dispersion and dipole-dipole forces are present.
- D) Only hydrogen bonding forces are present.

Answer: <https://biology-forums.com/index.php?topic=289753>

### Question 1583

An astronaut uses a laboratory balance and weighs an object on earth and again on the moon. Which statement below about the weight and mass of the object is true?

- A) The mass and weight will be identical on the earth and the moon.

- B) The mass will be the same on earth and moon but the weight will be less on the moon.  
C) The weight will be the same on earth and moon but the mass will be less on the moon.  
D) Both the mass and weight will be different on earth and moon.

Answer: <https://biology-forums.com/index.php?topic=288738>

### Question 1584

What substance has a rating of 10 on the Mohs hardness scale?

- A) beryllia  
B) silicon carbide  
C) diamond  
D) aluminum

Answer: <https://biology-forums.com/index.php?topic=291680>

### Question 1585

Which of the following is a semiconductor?

- A) Ca  
B) B  
C) K  
D) Pb

Answer: <https://biology-forums.com/index.php?topic=291677>

### Question 1586

What does the term "alpha" amino acid mean?

- A) The amino group attaches to the carbon in the carboxyl group.  
B) The amino group attaches to the carbon next to the carboxylic acid group.  
C) The amino acid contains only one carbon atom.  
D) The amino acid contains only one carboxylic acid group.

Answer: <https://biology-forums.com/index.php?topic=291970>

### Question 1587

The binding energy is defined as

- A) the amount of energy absorbed when electrons are added to an ion.  
B) the amount of energy absorbed when protons and neutrons form a nucleus.  
C) the amount of energy released when electrons are removed from the atom.  
D) the amount of energy required to break apart a nucleus into individual protons and neutrons.

Answer: <https://biology-forums.com/index.php?topic=291366>

### Question 1588

Among the compounds  $\text{H}_3\text{C}-\text{CH}_3$ ,  $\text{H}_2\text{C}=\text{CH}_2$ , and  $\text{HC}-\text{CH}$ , the compound with the strongest carbon-carbon bond is \_\_\_\_\_, and the compound with the longest carbon-carbon bond is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289649>

### Question 1589

Consider the following ground state electron configuration:  $1s^2 2s^2 2p^4$ . Which of the ions has this ground state electron configuration?

- A) F-1  
B) N+1  
C) C-2  
D) O-2

Answer: <https://biology-forums.com/index.php?topic=289477>

### Question 1590

What percentage of a radioactive substance remains after 6.00 half-lives have elapsed?

- A) 0.781%  
B) 1.56%  
C) 3.12%  
D) 6.25%

Answer: <https://biology-forums.com/index.php?topic=291439>

### Question 1591

The quantity 1.0857 qt rounded to two significant figures is \_\_\_\_\_ qt.

Answer: <https://biology-forums.com/index.php?topic=288859>

### Question 1592

Which of the following numbers has the greatest number of significant figures?

- A) 0.5070
- B) 0.201
- C) 234000
- D)  $3.69 \times 10^{24}$

Answer: <https://biology-forums.com/index.php?topic=288826>

### Question 1593

Assuming that sea water is a 3.5 wt % solution of NaCl in water, calculate its osmotic pressure at 20°C. The density of a 3.5% NaCl solution at 20°C is 1.023 g/mL.

- A) 1.0 atm
- B) 15 atm
- C) 29 atm
- D) 100 atm

Answer: <https://biology-forums.com/index.php?topic=290260>

### Question 1594

A 2.00 M solution of CaCl<sub>2</sub> in water has a density of 1.17 g/mL. What is the mole fraction of CaCl<sub>2</sub>?

- A) 0.0348
- B) 0.0360
- C) 0.0366
- D) 0.0380

Answer: <https://biology-forums.com/index.php?topic=290229>

### Question 1595

The number of orbitals in a given subshell, such as the 5d subshell, is determined by the number of possible values of

- A) n.
- B) l.
- C) ml.
- D) ms.

Answer: <https://biology-forums.com/index.php?topic=289388>

### Question 1596

Using shorthand notation, the ground-state electron configuration for F<sup>-</sup> is predicted to be \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289564>

### Question 1597

In order for the reaction  $HA + HSO_3^- \rightleftharpoons A^- + H_2SO_3$  to have an equilibrium constant  $K_c < 1$ , the  $K_a$  of HA must be \_\_\_\_\_ (greater, less) than the  $K_a$  of HSO<sub>3</sub><sup>-</sup>.

Answer: <https://biology-forums.com/index.php?topic=290815>

### Question 1598

Water is an example of

- A) a compound.
- B) an element.
- C) a mixture.
- D) an ion.

Answer: <https://biology-forums.com/index.php?topic=288988>

### Question 1599

What is the molality of ethanol in a solution made by dissolving 7.30 g of ethanol, C<sub>2</sub>H<sub>5</sub>OH, in 53.6 g of water?

- A) 0.00550 m
- B) 0.500 m
- C) 2.96 m
- D) 400 m

Answer: <https://biology-forums.com/index.php?topic=290299>

### Question 1600

Which one of the following compounds that contains a Group 5A element is least likely to exist?

- A) NF<sub>3</sub>
- B) NBr<sub>5</sub>
- C) PF<sub>3</sub>
- D) PI<sub>5</sub>

Answer: <https://biology-forums.com/index.php?topic=291885>

### Question 1601

What statement is not consistent with the chemistry of lead?

- A) It has the highest density of the group 4A elements.
- B) It is commonly used as a fuel additive in gasoline to boost the octane rating.
- C) It is obtained from its ore galena (PbS) by roasting in air and then by reduction with carbon monoxide.
- D) It is used in making pipes, cables, paint pigments and electrodes for storage batteries.

Answer: <https://biology-forums.com/index.php?topic=291756>

### Question 1602

The oxidation state of chlorine in ClO<sub>4</sub><sup>-</sup> is

- A) 0
- B) +5
- C) -5
- D) +7

Answer: <https://biology-forums.com/index.php?topic=289252>

### Question 1603

Lipids are characterized by what property?

- A) chemical reactivity
- B) chemical structure
- C) refractive index
- D) solubility

Answer: <https://biology-forums.com/index.php?topic=291964>

### Question 1604

What is the structure of the "gray" allotropic form of tin that is used as a semiconductor?

- A) body centered
- B) diamond-like
- C) graphite-like
- D) simple cubic

Answer: <https://biology-forums.com/index.php?topic=291755>

### Question 1605

How many cations and how many anions are in the unit cell?

- A) 4 cations and 4 anions
- B) 4 cations and 8 anions
- C) 4 cations and 14 anions
- D) 8 cations and 4 anions

Answer: <https://biology-forums.com/index.php?topic=290126>

### Question 1606

The number of electrons in the ion Ca<sup>2+</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289060>

### Question 1607

Which compound contains hydrogen atoms that form two types of bonds?

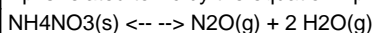
- A) B<sub>2</sub>H<sub>6</sub>
- B) C<sub>2</sub>H<sub>2</sub>
- C) C<sub>6</sub>H<sub>6</sub>

D) N<sub>2</sub>H<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=291745>

### Question 1608

K<sub>p</sub> is related to K<sub>c</sub> by the equation  $K_p = K_c (RT)^n$ . What is the value of n for the reaction below?



- A) -2
- B) -1
- C) +1
- D) +2

Answer: <https://biology-forums.com/index.php?topic=290497>

### Question 1609

The oxidation state of chromium in Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291588>

### Question 1610

Of H<sub>2</sub>CO and CO and CO<sub>2</sub>, the compound having the strongest C—O bond is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289659>

### Question 1611

Which type of bonding does Ca form upon solidification?

- A) covalent network
- B) ionic
- C) metallic
- D) molecular

Answer: <https://biology-forums.com/index.php?topic=290148>

### Question 1612

Which unit of radiation is frequently used in medicine to describe the amount of tissue damage caused by a radioactive substance?

- A) becquerel
- B) curie
- C) rad
- D) rem

Answer: <https://biology-forums.com/index.php?topic=291402>

### Question 1613

Undersea flora prefer a maximum concentration of OH<sup>-</sup> of  $1.58 \times 10^{-5}$ . The concentration of H<sub>3</sub>O<sup>+</sup> in the seawater is \_\_\_\_\_, and this solution is \_\_\_\_\_ (acidic, basic, neutral).

Answer: <https://biology-forums.com/index.php?topic=290807>

### Question 1614

Which orbital hybridization is associated with a tetrahedral cloud arrangement?

- A) sp
- B) sp<sup>2</sup>
- C) sp<sup>3</sup>
- D) sp<sup>4</sup>

Answer: <https://biology-forums.com/index.php?topic=289670>

### Question 1615

The rate of a nuclear reaction can be changed by

- A) adding a catalyst.
- B) increasing the volume.
- C) increasing the temperature.
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=291422>

### Question 1616

What is the oxidation number of H in H<sub>2</sub>?



- A) 0
- B) -2
- C) +3
- D) +1

Answer: <https://biology-forums.com/index.php?topic=291865>

### Question 1617

Which of the following compounds exhibits only dispersion and dipole-dipole intermolecular interactions?

- A) N<sub>2</sub>
- B) HBr
- C) CO<sub>2</sub>
- D) H<sub>2</sub>O

Answer: <https://biology-forums.com/index.php?topic=289754>

### Question 1618

What is the pH of a buffer solution made by mixing 50.0 mL of 0.100 M potassium hydrogen phthalate with 13.6 mL of 0.100 M NaOH and diluting the mixture to 100.0 mL with water? The K<sub>a2</sub> for hydrogen phthalate is  $3.1 \times 10^{-6}$ .

- A) 3.25
- B) 5.08
- C) 5.51
- D) 5.94

Answer: <https://biology-forums.com/index.php?topic=290839>

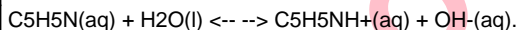
### Question 1619

The fundamental SI unit for measuring matter is the \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289189>

### Question 1620

How many grams of pyridine are there in 100 mL of an aqueous solution that has a pH of 9.00? The K<sub>b</sub> for pyridine is  $1.9 \times 10^{-9}$  and the equation of interest is



- A) 0.053 g
- B) 0.42 g
- C) 0.79 g
- D) 7.9 g

Answer: <https://biology-forums.com/index.php?topic=290707>

### Question 1621

The oxidation of sulfur dioxide by oxygen to sulfur trioxide has been implicated as an important step in the formation of acid rain:  $2 \text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{SO}_3(\text{g})$ . If the equilibrium partial pressures of SO<sub>2</sub>, O<sub>2</sub>, and SO<sub>3</sub> are 0.564 atm, 0.102 atm, and 0.333 atm respectively at 1000 K, what is K<sub>p</sub> at that temperature?

- A) 0.292
- B) 3.42
- C) 5.79
- D) 8.11

Answer: <https://biology-forums.com/index.php?topic=290504>

### Question 1622

Which one of the following elements is a poor conductor of heat and electricity?

- A) nickel
- B) sulfur
- C) aluminum
- D) lead

Answer: <https://biology-forums.com/index.php?topic=288963>

### Question 1623

What is the name of the complex ion [AuBrCl(CN)<sub>2</sub>]-?

- A) bromochlorodicyanogold(I) ion
- B) bromochlorodicyanoaurate(III) ion
- C) bromochlorodicyanoargentate(III) ion

D) bromochlorodicyanoaurate(IV) ion

Answer: <https://biology-forums.com/index.php?topic=291512>

### Question 1624

The hybrid orbital used by carbon to overlap with hydrogen in C<sub>2</sub>H<sub>2</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289762>

### Question 1625

Which of the following best describes ICl<sub>2</sub>? It has a molecular geometry that is

- A) linear with no lone pairs on the I atom.
- B) linear with lone pairs on the I atom.
- C) nonlinear with no lone pairs on the I atom.
- D) nonlinear with lone pairs on the I atom.

Answer: <https://biology-forums.com/index.php?topic=289725>

### Question 1626

The quantity 2.27 cm<sup>3</sup> is the same as \_\_\_\_\_ mL.

Answer: <https://biology-forums.com/index.php?topic=288852>

### Question 1627

The slowest step in a reaction mechanism is called the \_\_\_\_\_ step.

- A) termination
- B) elementary
- C) rate law
- D) rate-determining

Answer: <https://biology-forums.com/index.php?topic=290450>

### Question 1628

At 25°C, the pH of a vinegar solution is 2.60. What are the values of [H<sub>3</sub>O<sup>+</sup>] and [OH<sup>-</sup>] in the solution?

- A) 3.99 × 10<sup>-12</sup> M, 2.51 × 10<sup>-3</sup> M
- B) 2.51 × 10<sup>-3</sup> M, 3.98 × 10<sup>-12</sup> M
- C) 2.51 × 10<sup>-3</sup> M, 11.40 M
- D) 2.60 M, 11.40 M

Answer: <https://biology-forums.com/index.php?topic=290665>

### Question 1629

What is the molar solubility of lead(II) chromate in 0.10 M HNO<sub>3</sub> if the K<sub>sp</sub> for PbCrO<sub>4</sub> is 2.8 × 10<sup>-13</sup> and the K<sub>a2</sub> for H<sub>2</sub>CrO<sub>4</sub> is 3.0 × 10<sup>-7</sup>? Note that H<sub>2</sub>CrO<sub>4</sub> is considered to be a strong acid.

- A) 9.2 × 10<sup>-11</sup> M
- B) 2.9 × 10<sup>-10</sup> M
- C) 9.3 × 10<sup>-7</sup> M
- D) 3.1 × 10<sup>-4</sup> M

Answer: <https://biology-forums.com/index.php?topic=290874>

### Question 1630

Which compound is not an isomer of the other three?

- A) cyclohexane
- B) 1, 2-dimethylcyclobutane
- C) 1, 2-dimethylcyclopropane
- D) methylcyclopentane

Answer: <https://biology-forums.com/index.php?topic=291943>

### Question 1631

Which unit of radiation describes the amount of energy absorbed by a kilogram of tissue exposed to a radiation source?

- A) becquerel
- B) curie
- C) rad
- D) rem

Answer: <https://biology-forums.com/index.php?topic=291401>

### Question 1632

Which of the following indicates the most basic solution?

- A)  $[H^+] = 1 \times 10^{-10} \text{ M}$
- B)  $pOH = 6.7$
- C)  $[OH^-] = 7 \times 10^{-5} \text{ M}$
- D)  $pH = 4.2$

Answer: <https://biology-forums.com/index.php?topic=290667>

### Question 1633

Aluminum has a face-centered cubic structure and has a density of 2.70 g/cm<sup>3</sup>. What is its atomic radius?

- A) 143 pm
- B) 286 pm
- C) 405 pm
- D) 1150 pm

Answer: <https://biology-forums.com/index.php?topic=290157>

### Question 1634

Which element has the ground-state electron configuration  $[Xe]6s^2 4f^7$ ?

- A) Re
- B) Ir
- C) Eu
- D) Gd

Answer: <https://biology-forums.com/index.php?topic=289443>

### Question 1635

Which amino acid has the simplest structure?

- A) valine
- B) glycine
- C) asparagine
- D) arginine

Answer: <https://biology-forums.com/index.php?topic=292037>

### Question 1636

What is the chemical symbol for platinum?

- A) Pd
- B) Pr
- C) Pt
- D) Au

Answer: <https://biology-forums.com/index.php?topic=288935>

### Question 1637

Calculate the molar solubility of thallium(I) chloride in 0.30 M NaCl at 25°C.  $K_{sp}$  for  $TlCl$  is  $1.7 \times 10^{-4}$ .

- A)  $5.1 \times 10^{-5} \text{ M}$
- B)  $5.7 \times 10^{-4} \text{ M}$
- C)  $7.1 \times 10^{-3} \text{ M}$
- D)  $1.3 \times 10^{-2} \text{ M}$

Answer: <https://biology-forums.com/index.php?topic=290873>

### Question 1638

What mass percent of  $^{235}\text{U}$  (the fissionable isotope) is used in the fuel in nuclear power plants?

- A) 3%
- B) 14%
- C) 30%
- D) 85%

Answer: <https://biology-forums.com/index.php?topic=291445>

### Question 1639

The percentage of carbon in the endohedral fullerene complexes  $\text{KrC}_{60}$  and  $\text{XeC}_{60}$  is \_\_\_\_\_%C and \_\_\_\_\_%C, respectively.

Answer: <https://biology-forums.com/index.php?topic=291912>

### Question 1640

A solution is 2.25% by weight  $\text{NaHCO}_3$ . How many grams of  $\text{NaHCO}_3$  are in 250.0 g of solution?

- A) 0.900 g
- B) 5.62 g
- C) 117 g
- D) 225 g

Answer: <https://biology-forums.com/index.php?topic=290288>

### Question 1641

Using the three different isotopes of oxygen  $^{16}\text{O}$ ,  $^{17}\text{O}$ ,  $^{18}\text{O}$  and the major isotope of hydrogen,  $^1\text{H}$ . Determine the number of different types of isotopically substituted hydrogen peroxide,  $\text{H}_2\text{O}_2$ , that could be formed.

- A) 3
- B) 5
- C) 6
- D) 9

Answer: <https://biology-forums.com/index.php?topic=291804>

### Question 1642

Ionization energy of main-group elements generally

- A) increases from left to right across a period and increases down a group.
- B) increases from left to right across a period and decreases down a group.
- C) decreases from left to right across a period and increases down a group.
- D) decreases from left to right across a period and decreases down a group.

Answer: <https://biology-forums.com/index.php?topic=291712>

### Question 1643

Which of the following elements has the least tendency to form an ion?

- A) Ca
- B) Li
- C) Kr
- D) S

Answer: <https://biology-forums.com/index.php?topic=289028>

### Question 1644

At  $25^\circ\text{C}$  the vapor pressures of benzene and toluene are 96.0 mm Hg and 30.5 mm Hg, respectively. When a 1:1 molar mixture of benzene and toluene is fractionally distilled, the first fraction will have a mole fraction of benzene that is closest to

- A) 0.0.
- B) 0.5.
- C) 0.7.
- D) 1.0.

Answer: <https://biology-forums.com/index.php?topic=290245>

### Question 1645

KBr crystallizes in a cubic unit cell with  $\text{Br}^-$  ions on each corner and each face. How many  $\text{K}^+$  ions and  $\text{Br}^-$  ions are in each unit cell of KBr?

- A) 1  $\text{K}^+$  ion and 1  $\text{Br}^-$  ion
- B) 2  $\text{K}^+$  ions and 2  $\text{Br}^-$  ions
- C) 4  $\text{K}^+$  ions and 4  $\text{Br}^-$  ions
- D) 8  $\text{K}^+$  ions and 8  $\text{Br}^-$  ions

Answer: <https://biology-forums.com/index.php?topic=290113>

### Question 1646

One mole of which element has the smallest mass?

- A) Co
- B) Zn
- C) Ni
- D) Ru

Answer: <https://biology-forums.com/index.php?topic=288983>

### Question 1647

Identify the compound that contains two oxygens.

- A) aldehyde
- B) alkyne
- C) amine
- D) carboxylic acid

Answer: <https://biology-forums.com/index.php?topic=291989>

### Question 1648

Which type of radiation source would pose the greatest health risk when used internally for a medical procedure?

- A) an alpha emitter,  $t_{1/2} = 6$  hours
- B) a beta emitter,  $t_{1/2} = 5$  hours
- C) a beta emitter,  $t_{1/2} = 15$  days
- D) a gamma emitter,  $t_{1/2} = 4$  hours

Answer: <https://biology-forums.com/index.php?topic=291453>

### Question 1649

What is the electron geometry and molecular shape of  $\text{CH}_2\text{O}$ ?

- A) Tetrahedral, tetrahedral
- B) Trigonal planar, trigonal planar
- C) Trigonal planar, bent
- D) Tetrahedral, trigonal planar

Answer: <https://biology-forums.com/index.php?topic=289731>

### Question 1650

Which element can expand its valence shell to accommodate more than eight electrons?

- A) C
- B) F
- C) Xe
- D) He

Answer: <https://biology-forums.com/index.php?topic=289636>

### Question 1651

Which sphere most likely represents the  $\text{S}^{2-}$  ion?

- A) A
- B) B
- C) A or B
- D) C or D

Answer: <https://biology-forums.com/index.php?topic=289521>

### Question 1652

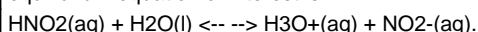
Which of the following is a fundamental SI Unit?

- A) millimeter
- B) meter
- C) hectometer
- D) nanometer

Answer: <https://biology-forums.com/index.php?topic=288787>

### Question 1653

Determine the acid dissociation constant for a 0.010 M nitrous acid solution that has a pH of 2.70. Nitrous acid is a weak monoprotic acid and the equilibrium equation of interest is



- A)  $8.0 \times 10^{-3}$
- B)  $2.0 \times 10^{-3}$
- C)  $5.0 \times 10^{-4}$
- D)  $4.0 \times 10^{-4}$

Answer: <https://biology-forums.com/index.php?topic=290682>

### Question 1654

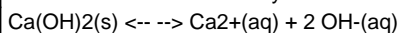
How many isomers are there for C<sub>5</sub>H<sub>12</sub>?

- A) 3
- B) 4
- C) 5
- D) 6

Answer: <https://biology-forums.com/index.php?topic=291938>

### Question 1655

The dissolution of calcium hydroxide is exothermic:



What happens when the solution of Ca(OH)<sub>2</sub> is heated?

- A) The amount of Ca(OH)<sub>2</sub>(s) decreases.
- B) The amount of Ca(OH)<sub>2</sub>(s) increases.
- C) The amount of Ca(OH)<sub>2</sub>(s) remains unchanged.
- D) The Ca(OH)<sub>2</sub>(s) completely dissolves.

Answer: <https://biology-forums.com/index.php?topic=290555>

### Question 1656

A 10.0-L flask containing He, 1.00 mole of Ar, and 3.00 mole of Ne has a total pressure of 24.5 atm at 25°C. How many moles of He are in the flask?

- A) 6.00 mol
- B) 10.0 mol
- C) 10.0 mol
- D) 119 mol

Answer: <https://biology-forums.com/index.php?topic=290027>

### Question 1657

What is the percent dissociation of a benzoic acid solution with pH = 2.59? The acid dissociation constant for this monoprotic acid is  $6.5 \times 10^{-5}$ .

- A) 0.50%
- B) 1.5%
- C) 2.5%
- D) 3.5%

Answer: <https://biology-forums.com/index.php?topic=290694>

### Question 1658

The change in the Gibbs free energy for dissolving solute in a saturated solution is

- A) negative.
- B) zero.
- C) positive.
- D) positive at low temperatures and negative at high temperatures.

Answer: <https://biology-forums.com/index.php?topic=290198>

### Question 1659

For an orbital, a node is

- A) the midpoint of the orbital.
- B) a surface inside which there is a 90% chance of finding the electron.
- C) a surface where there is a maximum probability of finding the electron.
- D) a surface where there is no chance of finding the electron.

Answer: <https://biology-forums.com/index.php?topic=289394>

### Question 1660

The diameter of an atom is approximately  $1 \times 10^{-10}$  m. What is the diameter in millimeters?

- A)  $1 \times 10^{-16}$  mm
- B)  $1 \times 10^{-13}$  mm
- C)  $1 \times 10^{-7}$  mm
- D)  $1 \times 10^{-4}$  mm

Answer: <https://biology-forums.com/index.php?topic=288745>

### Question 1661

Which of the following isotopes is not used for medical purposes?

- A)  $^{18}\text{F}$
- B)  $^{12}\text{C}$
- C)  $^{32}\text{P}$
- D)  $^{99\text{m}}\text{Tc}$

Answer: <https://biology-forums.com/index.php?topic=291450>

### Question 1662

The increased viscosity of molten sulfur at 160-195°C is due to the

- A) melting of S<sub>8</sub> to give discrete S<sub>8</sub> units.
- B) merging of the S<sub>8</sub> rings to give interlocking S<sub>8</sub> rings.
- C) opening of the S<sub>8</sub> rings to give smaller S units.
- D) opening of the S<sub>8</sub> rings which then polymerize into long chains.

Answer: <https://biology-forums.com/index.php?topic=291818>

### Question 1663

Which one of the following binary oxides is the most covalent?

- A) Li<sub>2</sub>O
- B) BaO
- C) SiO<sub>2</sub>
- D) Br<sub>2</sub>O<sub>5</sub>

Answer: <https://biology-forums.com/index.php?topic=291898>

### Question 1664

Orbitals used by carbon for bonding in C<sub>2</sub>H<sub>6</sub>, C<sub>2</sub>H<sub>4</sub>, and C<sub>2</sub>H<sub>2</sub> are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=292045>

### Question 1665

Which of the following mixtures have components which can be separated by filtration?

- A) colloids
- B) solutions
- C) suspensions
- D) all of these

Answer: <https://biology-forums.com/index.php?topic=290184>

### Question 1666

Which of the compounds H<sub>3</sub>PO<sub>4</sub>, Mg(OH)<sub>2</sub>, LiOH, and HCl, behave as bases when they are dissolved in water?

- A) Mg(OH)<sub>2</sub> and LiOH
- B) H<sub>3</sub>PO<sub>4</sub> and HCl
- C) only HCl
- D) only LiOH

Answer: <https://biology-forums.com/index.php?topic=289308>

### Question 1667

Which one of the following compounds that contains a Group 5A element is least likely to exist?

- A) NBr<sub>3</sub>
- B) NBr<sub>5</sub>
- C) PBr<sub>3</sub>
- D) PBr<sub>5</sub>

Answer: <https://biology-forums.com/index.php?topic=291888>

### Question 1668

What is the pH of a solution prepared by diluting 75.00 mL of 0.10 M HCl with enough water to produce a total volume of 100.00 mL?

- A) 1.00
- B) 1.12
- C) 2.00
- D) 2.24

Answer: <https://biology-forums.com/index.php?topic=290764>

### Question 1669

Sodium hypochlorite, NaOCl, is the active ingredient in household bleach. What is the concentration of hypochlorite ion if 20.00 mL of bleach requires 31.00 mL of 0.500 M HCl to reach the equivalence point?

- A) 0.275 M
- B) 0.333 M
- C) 0.775 M
- D) 1.28 M

Answer: <https://biology-forums.com/index.php?topic=290912>

### Question 1670

When dissolved in water, NaOH behaves as

- A) an acid that forms Na<sup>+</sup> and OH<sup>-</sup> ions.
- B) an acid that forms NaO<sup>-</sup> and H<sup>+</sup> ions.
- C) a base that forms Na<sup>+</sup> and OH<sup>-</sup> ions.
- D) a base that forms NaO<sup>-</sup> and H<sup>+</sup> ions.

Answer: <https://biology-forums.com/index.php?topic=289310>

### Question 1671

Molybdenum has an anomalous electron configuration. Write the electron configuration of Mo using shorthand notation.

- A) [Kr] 5s0 4d6
- B) [Kr] 5s0 4d0 5p6
- C) [Kr] 5s1 4d5
- D) [Kr] 5s2 4d4

Answer: <https://biology-forums.com/index.php?topic=289403>

### Question 1672

An unknown gas contains 83% C and 17% H by mass. It effuses at 0.87 times the rate of CO<sub>2</sub> gas under the same conditions. What is the molecular formula of the unknown gas?

- A) C<sub>2</sub>H<sub>5</sub>
- B) C<sub>3</sub>H<sub>3</sub>
- C) C<sub>4</sub>H<sub>10</sub>
- D) C<sub>7</sub>H<sub>17</sub>

Answer: <https://biology-forums.com/index.php?topic=289976>

### Question 1673

Which of the following statements best describes the difference between vegetable oils and animal fats?

- A) Animal fats have more carboxylic acid groups.
- B) Vegetable oils have carbon chains with more unsaturated bonds.
- C) Vegetable oils have more alcohol groups.
- D) Animal fats have more unsaturated bonds.

Answer: <https://biology-forums.com/index.php?topic=291968>

### Question 1674

Which process is used in the fabrication of ceramics?

- A) electrolysis
- B) reduction
- C) roasting
- D) sintering

Answer: <https://biology-forums.com/index.php?topic=291646>

### Question 1675

When alkanes react with chlorine in the presence of ultraviolet light, chlorine atoms substitute for one or more alkane hydrogen atoms. What is the number of different chloroalkane compounds that can be formed by the reaction of C<sub>2</sub>H<sub>6</sub> with chlorine?

- A) 3
- B) 6
- C) 9
- D) 12

Answer: <https://biology-forums.com/index.php?topic=291939>



### Question 1676

The oxidation number of chromium in  $\text{Ag}_2\text{Cr}_2\text{O}_7$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289353>

### Question 1677

The heat of combustion per mole for acetylene,  $\text{C}_2\text{H}_2(\text{g})$ , is  $-1299.5 \text{ kJ/mol}$ . Assuming that the combustion products are  $\text{CO}_2(\text{g})$  and  $\text{H}_2\text{O}(\text{l})$ , and given that the enthalpy of formation is  $-393.5 \text{ kJ/mol}$  for  $\text{CO}_2(\text{g})$  and  $-285.8 \text{ kJ/mol}$  for  $\text{H}_2\text{O}(\text{l})$ , find the enthalpy of formation of  $\text{C}_2\text{H}_2(\text{g})$ .

- A)  $-846.1 \text{ kJ/mol}$
- B)  $-620.2 \text{ kJ/mol}$
- C)  $-226.7 \text{ kJ/mol}$
- D)  $+226.7 \text{ kJ/mol}$

Answer: <https://biology-forums.com/index.php?topic=289821>

### Question 1678

When using the ideal gas law the temperature must be expressed in \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290054>

### Question 1679

What is the percent dissociation of ascorbic acid if the solution has a  $\text{pH} = 5.50$  and a  $\text{pK}_a = 4.10$ ?

- A) 96%
- B) 10%
- C) 5%
- D) 1%

Answer: <https://biology-forums.com/index.php?topic=290848>

### Question 1680

Platinum in the catalytic converter of an automobile catalyzes the conversion of  $\text{CO}$  to  $\text{CO}_2$  is an example of a \_\_\_\_\_ (heterogeneous, homogeneous) catalyst.

Answer: <https://biology-forums.com/index.php?topic=290483>

### Question 1681

The element in period 3 with the smallest seventh ionization energy is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289575>

### Question 1682

What is the density of carbon monoxide gas at STP?

- A)  $0.510 \text{ g/L}$
- B)  $0.800 \text{ g/L}$
- C)  $1.96 \text{ g/L}$
- D)  $1.25 \text{ g/L}$

Answer: <https://biology-forums.com/index.php?topic=289946>

### Question 1683

Freezing point depression, boiling point elevation, vapor pressure lowering, and osmotic pressure are examples of \_\_\_\_\_ properties, which depend on the amount but not the chemical identity of dissolved particles.

Answer: <https://biology-forums.com/index.php?topic=290336>

### Question 1684

Calculate the concentration of bicarbonate ion,  $\text{HCO}_3^-$ , in a  $0.010 \text{ M H}_2\text{CO}_3$  solution that has the stepwise dissociation constants  $\text{K}_{a1} = 4.3 \times 10^{-7}$  and  $\text{K}_{a2} = 5.6 \times 10^{-11}$ .

- A)  $6.6 \times 10^{-5} \text{ M}$
- B)  $4.3 \times 10^{-7} \text{ M}$
- C)  $4.3 \times 10^{-9} \text{ M}$
- D)  $5.6 \times 10^{-11} \text{ M}$

Answer: <https://biology-forums.com/index.php?topic=290699>

### Question 1685

Of BrF<sub>3</sub> and PF<sub>3</sub>, the one with the smaller bond angles is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289758>

### Question 1686

In which compound does oxygen have a -1 oxidation state?

- A) H<sub>2</sub>O
- B) H<sub>2</sub>O<sub>2</sub>
- C) O<sub>2</sub>
- D) MgO

Answer: <https://biology-forums.com/index.php?topic=291813>

### Question 1687

Which of the following can be interpreted as a measure of randomness?

- A) enthalpy
- B) entropy
- C) free energy
- D) temperature

Answer: <https://biology-forums.com/index.php?topic=289823>

### Question 1688

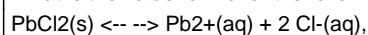
Which of the following two atoms are isotopes?

- A) Ar and Ca
- B) C and C
- C) Cl and Br
- D) Mg and C

Answer: <https://biology-forums.com/index.php?topic=288891>

### Question 1689

What is the value for K<sub>c</sub> for the following reaction:



if  $\text{PbCl}_2(\text{s}) = 1.50$  grams,  $[\text{Pb}^{2+}] = 1.6 \times 10^{-2}$  M and  $[\text{Cl}^{-}] = 3.2 \times 10^{-2}$  M at equilibrium? (The molar mass of  $\text{PbCl}_2(\text{s})$  is 278 g/mol and its density is 5.85 g/cm<sup>3</sup>.)

- A)  $7.6 \times 10^{-7}$
- B)  $1.6 \times 10^{-5}$
- C)  $6.2 \times 10^4$
- D)  $1.3 \times 10^6$

Answer: <https://biology-forums.com/index.php?topic=290517>

### Question 1690

At 25°C the vapor pressures of benzene and toluene are 96.0 mm Hg and 30.5 mm Hg, respectively. The vapor pressure of a solution that has a 0.50 mole fraction of toluene will have a vapor pressure \_\_\_\_\_ (equal to, greater than, less than) 30.5 mm Hg.

Answer: <https://biology-forums.com/index.php?topic=290343>

### Question 1691

Which two ions have the same electron configuration in the ground state?

- A) Cs<sup>+</sup> and Li<sup>+</sup>
- B) Ca<sup>2+</sup> and Cl<sup>-</sup>
- C) Se<sup>2+</sup> and Cl<sup>-</sup>
- D) Fe<sup>2+</sup> and Fe<sup>3+</sup>

Answer: <https://biology-forums.com/index.php?topic=289527>

### Question 1692

Sintering is

- A) a filtration process through a molecular sieve.
- B) the process of heating particles of a powder below the melting point so that they fuse together.
- C) the process of rapid cooling of a material to yield a superconducting mixture.
- D) the process of removing metals from ore by passing material through a magnetic field.

Answer: <https://biology-forums.com/index.php?topic=291647>

### Question 1693

For a reaction that follows the general rate law,  $\text{Rate} = k[A][B]^2$ , what will happen to the rate of reaction if the concentration of A is increased by a factor of 3.00? The rate will

- A) decrease by a factor of 1/9.00.
- B) decrease by a factor of 1/3.00.
- C) increase by a factor of 3.00.
- D) increase by a factor of 9.00.

Answer: <https://biology-forums.com/index.php?topic=290360>

### Question 1694

Which period 3 element has successive first through seventh ionization energies (kJ/mol) of  $E_{i1} = 578$ ;  $E_{i2} = 1,817$ ;  $E_{i3} = 2,745$ ;  $E_{i4} = 11,575$ ;  $E_{i5} = 14,830$ ;  $E_{i6} = 18,376$ ; and  $E_{i7} = 23,293$ ?

- A) Mg
- B) Al
- C) S
- D) Cl

Answer: <https://biology-forums.com/index.php?topic=289497>

### Question 1695

What is the  $[\text{CH}_3\text{CO}_2^-]/[\text{CH}_3\text{CO}_2\text{H}]$  ratio necessary to make a buffer solution with a pH of 4.44?  $K_a = 1.8 \times 10^{-5}$  for  $\text{CH}_3\text{CO}_2\text{H}$ .

- A) 0.50:1
- B) 0.94:1
- C) 1.1:1
- D) 2.0:1

Answer: <https://biology-forums.com/index.php?topic=290838>

### Question 1696

The decomposition of ammonia to nitrogen and hydrogen on a tungsten filament at  $800^\circ\text{C}$  is independent of the concentration of ammonia at high pressures of ammonia. What is the order of the reaction with respect to ammonia?

- A) zero
- B) first
- C) second
- D) third

Answer: <https://biology-forums.com/index.php?topic=290362>

### Question 1697

How many possible tripeptides can be made with the amino acids: tyrosine, histidine, and cysteine, each used only once?

- A) 3
- B) 4
- C) 6
- D) 9

Answer: <https://biology-forums.com/index.php?topic=291980>

### Question 1698

A balloon contains 0.76 mol  $\text{N}_2$ , 0.18 mol  $\text{O}_2$ , 0.031 mol He and 0.026 mol  $\text{H}_2$  at 739 mm Hg. What is the partial pressure of  $\text{O}_2$ ?

- A) 19 mm Hg
- B) 23 mm Hg
- C) 130 mm Hg
- D) 560 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290021>

### Question 1699

The volume of 350. mL of gas at  $25^\circ\text{C}$  is decreased to 250. mL at constant pressure. What is the final temperature of the gas?

- A)  $-60.1^\circ\text{C}$
- B)  $213^\circ\text{C}$
- C)  $17.8^\circ\text{C}$
- D)  $144^\circ\text{C}$

Answer: <https://biology-forums.com/index.php?topic=289929>

### Question 1700

An electrolytic cell is

- A) a battery.
- B) a cell in which the cell reaction is spontaneous.
- C) a cell in which an electric current drives a nonspontaneous reaction.
- D) a cell in which reactants are continuously supplied to the cell.

Answer: <https://biology-forums.com/index.php?topic=291159>

### Question 1701

Isoeugenol is the compound which gives the characteristic odor to nutmeg and contains carbon, hydrogen, and oxygen. If a 0.500 g sample of isoeugenol is combusted it gives 1.341 g of CO<sub>2</sub> and 0.329 g of H<sub>2</sub>O. Isoeugenol has a molecular weight of 164 g/mol. What is the molecular formula of isoeugenol?

- A) C<sub>2</sub>H<sub>2</sub>O
- B) C<sub>5</sub>H<sub>6</sub>O
- C) C<sub>8</sub>H<sub>4</sub>O<sub>4</sub>
- D) C<sub>10</sub>H<sub>12</sub>O<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289119>

### Question 1702

How many moles are in 1.50 g of ethylamine, CH<sub>3</sub>CH<sub>2</sub>NH<sub>2</sub>?

- A) 0.0222 mol
- B) 0.0332 mol
- C) 90.16 mol
- D) 45.08 mol

Answer: <https://biology-forums.com/index.php?topic=289082>

### Question 1703

The element Ga has how many valence electrons?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=289439>

### Question 1704

The edge length of a face-centered cubic lattice of NaCl is 564 pm. What is the density of NaCl in g/cm<sup>3</sup>?

- A) 0.720
- B) 1.08
- C) 2.16
- D) 4.32

Answer: <https://biology-forums.com/index.php?topic=290116>

### Question 1705

Which compound will have the largest dipole moment?

- A) cis-1, 2-dichloroethylene
- B) trans-1, 2-dichloroethylene
- C) tetrabromoethylene
- D) tetrachloroethylene

Answer: <https://biology-forums.com/index.php?topic=291959>

### Question 1706

Which of the following has the greatest mass?

- A)  $6.02 \times 10^{23}$  molecules of Cl<sub>2</sub>
- B) 35.45 g of Cl<sub>2</sub>
- C) 0.500 mol of Cl<sub>2</sub>
- D) All of these have the same mass.

Answer: <https://biology-forums.com/index.php?topic=289092>

### Question 1707

How many cations are there in 50.0 g of sodium phosphate?

- A)  $1.84 \times 10^{23}$  cations
- B)  $5.51 \times 10^{23}$  cations
- C)  $1.97 \times 10^{24}$  cations
- D)  $5.92 \times 10^{24}$  cations

Answer: <https://biology-forums.com/index.php?topic=289141>

### Question 1708

A steel pipe can be protected from corrosion by attaching the pipe to a piece of magnesium because

- A) magnesium forms a tight oxide coating.
- B) magnesium is more easily oxidized than iron.
- C) magnesium is inert.
- D) magnesium and steel form a corrosion resistant alloy.

Answer: <https://biology-forums.com/index.php?topic=291158>

### Question 1709

In the protein, Val-Tyr-His-Pro, which amino acid contains the N-terminal group?

- A) histidine
- B) proline
- C) tyrosine
- D) valine

Answer: <https://biology-forums.com/index.php?topic=291978>

### Question 1710

Of  $\text{NH}_4^+$  and  $\text{NH}_3$  the one with the smaller bond angles is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289759>

### Question 1711

The reaction  $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{O}_2(\text{g})$  is endothermic 298 K. The effect of adding a catalyst to the system at equilibrium will \_\_\_\_\_ (decrease, increase, have no effect on) the total quantity of  $\text{CaCO}_3$  once equilibrium is reestablished.

Answer: <https://biology-forums.com/index.php?topic=290626>

### Question 1712

The complex  $[\text{Ni}(\text{CN})_4]^{2-}$  is diamagnetic and the complex  $[\text{NiCl}_4]^{2-}$  is paramagnetic. What can you conclude about their molecular geometries?

- A) Both complexes have square planar geometries.
- B) Both complexes have tetrahedral geometries.
- C)  $[\text{NiCl}_4]^{2-}$  has a square planar geometry while  $[\text{Ni}(\text{CN})_4]^{2-}$  has a tetrahedral geometry.
- D)  $[\text{NiCl}_4]^{2-}$  has a tetrahedral geometry while  $[\text{Ni}(\text{CN})_4]^{2-}$  has a square planar geometry.

Answer: <https://biology-forums.com/index.php?topic=291518>

### Question 1713

Given the reaction at a certain temperature:  $2 \text{HI}(\text{g}) \rightleftharpoons \text{H}_2(\text{g}) + \text{I}_2(\text{g})$ . At equilibrium, the partial pressure of HI is  $1.8 \times 10^{-3}$  atm, and the partial pressures for  $\text{H}_2$  and  $\text{I}_2$  are 0.10 atm each. Find  $K_p$  at that temperature.

- A)  $3.2 \times 10^{-4}$
- B)  $5.6 \times 10^1$
- C)  $3.1 \times 10^3$
- D)  $3.1 \times 10^4$

Answer: <https://biology-forums.com/index.php?topic=290505>

### Question 1714

Which of the following chlorides is the most ionic?

- A)  $\text{CH}_2\text{Cl}_2$
- B)  $\text{SiCl}_4$
- C)  $\text{PbCl}_2$
- D)  $\text{PbCl}_4$

Answer: <https://biology-forums.com/index.php?topic=291877>

### Question 1715

What is the chemical symbol for an atom that has 29 protons and 36 neutrons?

- A) Cu
- B) Kr
- C) N
- D) Tb

Answer: <https://biology-forums.com/index.php?topic=288896>

### Question 1716

Carbon-14, which is present in all living tissue, radioactively decays via a first-order process. A one-gram sample of wood taken from a living tree gives a rate for carbon-14 decay of 13.6 counts per minute. If the half-life for carbon-14 is 5715 years, how old is a wood sample that gives a rate for carbon-14 decay of 3.9 counts per minute?

- A)  $4.6 \times 10^3$  yr
- B)  $6.6 \times 10^3$  yr
- C)  $1.0 \times 10^4$  yr
- D)  $2.9 \times 10^4$  yr

Answer: <https://biology-forums.com/index.php?topic=291411>

### Question 1717

Given three cylinders containing O<sub>2</sub> gas at the same volume and pressure. Cylinder A is at -35°F, cylinder B is at -15°C, cylinder C is at 250 K. Which cylinder contains the largest mass of oxygen?

- A) cylinder A
- B) cylinder B
- C) cylinder C
- D) All cylinders contain the same mass of O<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=290011>

### Question 1718

Of the following, which atom has the largest atomic radius?

- A) Na
- B) Cl
- C) K
- D) Br

Answer: <https://biology-forums.com/index.php?topic=289446>

### Question 1719

A neutral atom with atomic number 5 and mass number 11 contains \_\_\_\_\_ electrons.

Answer: <https://biology-forums.com/index.php?topic=289054>

### Question 1720

Which element of group 4A has the greatest density?

- A) C
- B) Ge
- C) Sn
- D) Pb

Answer: <https://biology-forums.com/index.php?topic=291751>

### Question 1721

The molecule believed to be most responsible for global warming is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290071>

### Question 1722

In a representation of an orbital, a region having zero probability of finding an electron is called a \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289465>

### Question 1723

Which is an amino acid polar neutral side chain?

- A) -CH<sub>3</sub>

- B) -CH<sub>2</sub>OH
- C) -CH<sub>2</sub>CO<sub>2</sub>H
- D) -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=291973>

### Question 1724

What are the basic oxides of the following set Cs<sub>2</sub>O, CaO, P<sub>4</sub>O<sub>10</sub>, SO<sub>3</sub>, and I<sub>2</sub>O<sub>7</sub>?

- A) Cs<sub>2</sub>O and CaO
- B) Cs<sub>2</sub>O, CaO, and P<sub>4</sub>O<sub>10</sub>
- C) P<sub>4</sub>O<sub>10</sub>, SO<sub>3</sub>, and I<sub>2</sub>O<sub>7</sub>
- D) SO<sub>3</sub> and I<sub>2</sub>O<sub>7</sub>

Answer: <https://biology-forums.com/index.php?topic=291889>

### Question 1725

What is the angle between adjacent sp<sup>3</sup> hybrid orbitals?

- A) 90°
- B) 109.5°
- C) 120°
- D) 180°

Answer: <https://biology-forums.com/index.php?topic=289671>

### Question 1726

What is the ground-state electron configuration of Se<sup>2-</sup>?

- A) [Ar]3d<sup>10</sup>4s<sup>2</sup>4p<sup>2</sup>
- B) [Ar]3d<sup>10</sup>4s<sup>2</sup>4p<sup>4</sup>
- C) [Ar]3d<sup>12</sup>4s<sup>2</sup>4p<sup>4</sup>
- D) [Ar]3d<sup>10</sup>4s<sup>2</sup>4p<sup>6</sup>

Answer: <https://biology-forums.com/index.php?topic=289475>

### Question 1727

In which compound is phosphorus in its lowest oxidation state?

- A) P<sub>2</sub>O<sub>5</sub>
- B) PBr<sub>3</sub>
- C) PH<sub>3</sub>
- D) PCl<sub>5</sub>

Answer: <https://biology-forums.com/index.php?topic=291886>

### Question 1728

The first law of thermodynamics

- A) defines water energy.
- B) defines energy.
- C) is a statement of conservation of energy.
- D) provides a criterion for the spontaneity of a reaction.

Answer: <https://biology-forums.com/index.php?topic=289849>

### Question 1729

Which compound is a saturated hydrocarbon?

- A) benzene
- B) cycloheptene
- C) 2-methylhexane
- D) butyne

Answer: <https://biology-forums.com/index.php?topic=292002>

### Question 1730

Which of the following statements is not true?

- A) The reverse of a spontaneous reaction is always nonspontaneous.
- B) A spontaneous process always moves toward equilibrium.
- C) A nonspontaneous process cannot be caused to occur.
- D) A highly spontaneous process need not occur rapidly.

Answer: <https://biology-forums.com/index.php?topic=290954>

### Question 1731

An approximation of absolute zero was made from an extrapolation of

- A) P vs.  $1/V$ .
- B) V vs. T.
- C) n vs. V.
- D) V vs.  $1/T$ .

Answer: <https://biology-forums.com/index.php?topic=289925>

### Question 1732

The equivalence point pH of the titration of four weak acids is given. Which is the strongest acid?

- A) 7.18
- B) 7.90
- C) 8.14
- D) 8.43

Answer: <https://biology-forums.com/index.php?topic=290911>

### Question 1733

What is the approximate pH of a solution X that gives the following responses with the indicators shown?

Indicators HIn — In- pH range Solution X

methyl orange red-yellow 3.2-4.4 yellow

methyl red red-yellow 4.8-6.0 yellow

bromothymol blue yellow-blue 6.0-7.6 green

phenolphthalein colorless-pink 8.2-10.0 colorless

- A) 3.2 - 4.4
- B) 4.8 - 6.0
- C) 6.0 - 7.6
- D) 8.2 - 10.0

Answer: <https://biology-forums.com/index.php?topic=290668>

### Question 1734

What is the molar mass of nitrogen gas?

- A) 14.0 g/mol
- B) 28.0 g/mol
- C)  $6.02 \times 10^{23}$  g/mol
- D)  $1.20 \times 10^{23}$  g/mol

Answer: <https://biology-forums.com/index.php?topic=289129>

### Question 1735

What is the molar concentration of sulfate ions in a 0.450 M  $K_2SO_4$  solution?

- A) 0.225 M
- B) 0.450 M
- C) 0.900 M
- D) 1.35 M

Answer: <https://biology-forums.com/index.php?topic=289294>

### Question 1736

How many protons (p) and neutrons (n) are in an atom of Ra?

- A) 88 p, 138 n
- B) 88 p, 226 n
- C) 138 p, 88 n
- D) 226 p, 88 n

Answer: <https://biology-forums.com/index.php?topic=288973>

### Question 1737

What is the mass of 0.500 mol of carbon tetrafluoride,  $CF_4$ ?

- A)  $5.68 \times 10^{-3}$  g
- B) 44.0 g
- C) 88.0 g
- D) 176 g



Answer: <https://biology-forums.com/index.php?topic=289131>

### Question 1738

As a rule, which of the following phases are not included in the equilibrium constant expression?

I. pure liquids II. pure solids III. aqueous solutions IV. gases

- A) I, II
- B) I, IV
- C) III, IV
- D) II, III

Answer: <https://biology-forums.com/index.php?topic=290512>

### Question 1739

The electronegativity is 2.1 for H and 3.0 for N. Based on these electronegativities,  $\text{NH}_4^+$  would be expected to

- A) be ionic and contain  $\text{H}^-$  ions.
- B) be ionic and contain  $\text{H}^+$  ions.
- C) have polar covalent bonds with a partial negative charges on the H atoms.
- D) have polar covalent bonds with a partial positive charges on the H atoms.

Answer: <https://biology-forums.com/index.php?topic=289592>

### Question 1740

What is the pH of a solution prepared by diluting 25.00 mL of 0.020 M  $\text{Ba}(\text{OH})_2$  with enough water to produce a total volume of 250.00 mL?

- A) 2.40
- B) 2.70
- C) 11.30
- D) 11.60

Answer: <https://biology-forums.com/index.php?topic=290676>

### Question 1741

Identify the amine.

- A)  $\text{CH}_3\text{CH}_2\text{COOCH}_3$
- B)  $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_3$
- C)  $\text{CH}_3\text{CH}_2\text{OH}$
- D)  $\text{CH}_3\text{CH}_2\text{H}_2$

Answer: <https://biology-forums.com/index.php?topic=291996>

### Question 1742

The difference between the boiling point and freezing point of water is  $100^\circ\text{C}$ , which is \_\_\_\_\_ kelvins.

Answer: <https://biology-forums.com/index.php?topic=288850>

### Question 1743

In which case should  $\text{CO}_2(\text{g})$  be more soluble in water?

- A) The total pressure is 6 atm and the partial pressure of  $\text{CO}_2$  is 1 atm.
- B) The total pressure is 4 atm and the partial pressure of  $\text{CO}_2$  is 3 atm.
- C) The total pressure is 1 atm and the partial pressure of  $\text{CO}_2$  is 0.03 atm.
- D) The total pressure is 1 atm and the partial pressure of  $\text{CO}_2$  is 0.4 atm.

Answer: <https://biology-forums.com/index.php?topic=290306>

### Question 1744

Radiation is dangerous to organisms because

- A) all radionuclides are poisonous.
- B) it causes electrolysis of water in the cells.
- C) it causes nuclear reactions in the cells.
- D) it ionizes molecules in the cells.

Answer: <https://biology-forums.com/index.php?topic=291410>

### Question 1745

What is the Celsius temperature of 100.0 g of chlorine gas in a 45.0-L container at 800 mm Hg?

- A)  $-68^\circ\text{C}$
- B)  $136^\circ\text{C}$

C) 205°C

D) 410°C

Answer: <https://biology-forums.com/index.php?topic=290008>

### Question 1746

Which of the following can function as a chelating agent?

A) CN-

B) CO

C) H<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>

D) NCS-

Answer: <https://biology-forums.com/index.php?topic=291509>

### Question 1747

List all the elements that have a ground-state configuration with five unpaired electrons in the 3d subshell.

A) Mn, Fe, Co, Cu, and Zn

B) Cr and Mn

C) Cr

D) Mn

Answer: <https://biology-forums.com/index.php?topic=289407>

### Question 1748

Calculate the hydroxide ion concentration in an aqueous solution that contains 3.50 × 10<sup>-5</sup> M in hydronium ion.

A) 2.86 × 10<sup>-2</sup> M

B) 2.86 × 10<sup>-9</sup> M

C) 2.86 × 10<sup>-10</sup> M

D) 3.50 × 10<sup>-10</sup> M

Answer: <https://biology-forums.com/index.php?topic=290750>

### Question 1749

What is the value of the gas constant, R, in units of ?

A) 1.080 × 10<sup>-4</sup>

B) 0.1080

C) 62.36

D) 6.236 × 10<sup>4</sup>

Answer: <https://biology-forums.com/index.php?topic=289933>

### Question 1750

What statement about nitric acid is not true?

A) It is a strong oxidizing agent.

B) It is one of the more common strong acids and is essentially 100% dissociated in water.

C) It often has a yellow color due to the formation of NO<sub>2</sub>.

D) Its anhydride is N<sub>2</sub>O<sub>3</sub>.

Answer: <https://biology-forums.com/index.php?topic=291791>

### Question 1751

Which of the following molecules does not have a dipole moment?

A) C<sub>2</sub>H<sub>4</sub>

B) NH<sub>3</sub>

C) CH<sub>3</sub>NH<sub>2</sub>

D) HCl

Answer: <https://biology-forums.com/index.php?topic=289738>

### Question 1752

Calculate the pH of a 0.20 M H<sub>2</sub>SO<sub>3</sub> solution that has the stepwise dissociation constants Ka<sub>1</sub> = 1.5 × 10<sup>-2</sup> and Ka<sub>2</sub> = 6.3 × 10<sup>-8</sup>.

A) 1.26

B) 1.32

C) 1.82

D) 2.52

Answer: <https://biology-forums.com/index.php?topic=290698>

### Question 1753

A saturated solution is defined as

- A) a concentrated solution.
- B) a solution that is in equilibrium with pure solute.
- C) a solution that is in equilibrium with undissolved solute.
- D) a solution that is not in equilibrium with both pure solvent and undissolved solute.

Answer: <https://biology-forums.com/index.php?topic=290304>

### Question 1754

The diameter of the nucleus of an atom is approximately  $1 \times 10^{-15}$  meters. If 1 nm is equal to  $10^9$  what is the diameter of the nucleus in

- A)  $1 \times 10^{-23}$  Å
- B)  $1 \times 10^{-8}$  Å
- C)  $1 \times 10^{-7}$  Å
- D)  $1 \times 10^{-5}$  Å

Answer: <https://biology-forums.com/index.php?topic=288746>

### Question 1755

Covalent bonding is a

- A) gain of electrons.
- B) loss of electrons.
- C) transfer of electrons.
- D) sharing of electrons.

Answer: <https://biology-forums.com/index.php?topic=289581>

### Question 1756

A solution is prepared by dissolving 171 g of  $\text{CdCl}_2$  in enough water to make exactly 250.0 mL of solution. If the density of the solution is 1.556 g/mL, what is the weight percent of  $\text{CdCl}_2$  in the solution?

- A) 7.17%
- B) 44.0%
- C) 56.0%
- D) 68.4%

Answer: <https://biology-forums.com/index.php?topic=290212>

### Question 1757

Of the following, which element has the highest first ionization energy?

- A) Ba
- B) I
- C) Rb
- D) Po

Answer: <https://biology-forums.com/index.php?topic=289536>

### Question 1758

Molecular vibrational energy transitions are observed in the infrared, molecular rotational transitions in the microwave, and electronic transitions in the ultraviolet-visible range. Which transitions require the most energy and which the least energy?

- A) Electronic transitions require the least energy and vibrational transitions the most.
- B) Rotational transitions require the least energy and electronic transitions the most.
- C) Vibrational transitions require the least energy and electronic transitions the most.
- D) Vibrational transitions require the least energy and rotational transitions the most.

Answer: <https://biology-forums.com/index.php?topic=289369>

### Question 1759

$\text{Na}_2\text{S}$  is named

- A) sodium disulfide.
- B) sodium sulfide.
- C) sodium(II) sulfide.
- D) sodium sulfur.

Answer: <https://biology-forums.com/index.php?topic=289010>

### Question 1760

A sample of pure lithium chloride contains 16% lithium by mass. What is the % lithium by mass in a sample of pure lithium carbonate that has twice the mass of the first sample?

- A) 8.20%
- B) 16.4%
- C) 32.8%
- D) 65.6%

Answer: <https://biology-forums.com/index.php?topic=288967>

### Question 1761

The number of nucleons in an atom or ion is the same as the

- A) atomic number.
- B) charge on the atom or ion.
- C) mass number.
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=291313>

### Question 1762

Which one of the following salts, when dissolved in water, produces the solution with the highest pH?

- A) LiI
- B) LiBr
- C) LiCl
- D) LiF

Answer: <https://biology-forums.com/index.php?topic=290796>

### Question 1763

There are three different isotopes of hydrogen  $^1\text{H}$ ,  $^2\text{H}$ ,  $^3\text{H}$  and three different isotopes of oxygen  $^{16}\text{O}$ ,  $^{17}\text{O}$ ,  $^{18}\text{O}$ . Indicate the number of different types of isotopically substituted water,  $\text{H}_2\text{O}$ , that could be formed.

- A) 9
- B) 12
- C) 15
- D) 18

Answer: <https://biology-forums.com/index.php?topic=291803>

### Question 1764

The molecular geometry of  $\text{OCCl}_2$  is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289756>

### Question 1765

Assume a heteronuclear diatomic molecule, AB, forms a one-dimensional crystal by lining up along the x-axis. Also assume that each molecule can only have one of six possible orientations, corresponding to atom A facing in either the positive or negative direction along the x-, y-, or z-axis. If the molecules are arranged randomly in the six directions, the molar entropy at absolute zero should be

- A)  $R \ln 6$ .
- B)  $R \ln 66$ .
- C)  $R \ln 6!$
- D) 0.

Answer: <https://biology-forums.com/index.php?topic=290971>

### Question 1766

What is the relation between joules (J), volts (V), and coulombs (C)?

- A)  $1 \text{ J} = 1 \text{ V} \times 1 \text{ C}$
- B)  $1 \text{ J} = 1 \text{ V} \div 1 \text{ C}$
- C)  $1 \text{ J} = 1 \text{ C} \div 1 \text{ V}$
- D)  $1 \text{ J} = 1 \text{ V} \times 1 \text{ C}^2$

Answer: <https://biology-forums.com/index.php?topic=291107>

### Question 1767

Each of three identical 15.0-L gas cylinders contains 7.50 mol of gas at 295 K. Cylinder A contains HCN, cylinder B contains  $\text{NO}_2$ , and cylinder C

contains O<sub>3</sub>. According to the kinetic molecular theory, which gas has the highest average kinetic energy?

- A) HCN
- B) NO<sub>2</sub>
- C) O<sub>3</sub>
- D) All have identical average kinetic energies

Answer: <https://biology-forums.com/index.php?topic=290038>

### Question 1768

The number of moles of Li in 34.7 g Li is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289058>

### Question 1769

How many chloride ions are in 1.50 mol of aluminum chloride?

- A) 2.00 chloride ions
- B) 2.009.023 chloride ions
- C)  $9.023 \times 10^{23}$  chloride ions
- D)  $2.71 \times 10^{24}$  chloride ions

Answer: <https://biology-forums.com/index.php?topic=289160>

### Question 1770

Molecular mass can be determined by

- A) combustion analysis.
- B) mass spectrometry.
- C) titration.
- D) weighing with an analytical balance.

Answer: <https://biology-forums.com/index.php?topic=289123>

### Question 1771

How many lone pairs of electrons are on the P atom in PF<sub>3</sub>?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289633>

### Question 1772

The factor 10<sup>6</sup> corresponds to which prefix?

- A) deka
- B) deci
- C) mega
- D) milli

Answer: <https://biology-forums.com/index.php?topic=288786>

### Question 1773

The number of metallic elements in period 3 of the periodic table is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291902>

### Question 1774

Benzoic acid (C<sub>6</sub>H<sub>5</sub>CO<sub>2</sub>H = HBz) solutions are sometimes used in experiments to determine the molarity of a basic solution of unknown concentration. What is the pH of a 0.100 M solution of benzoic acid if K<sub>a</sub> = 6.5 × 10<sup>-5</sup> and the equilibrium equation of interest is HBz(aq) + H<sub>2</sub>O(l) <--> H<sub>3</sub>O<sup>+</sup>(aq) + Bz<sup>-</sup>(aq).

- A) 1.00
- B) 2.59
- C) 4.19
- D) 5.19

Answer: <https://biology-forums.com/index.php?topic=290690>

### Question 1775

If the cell reaction involves ions in solution, as the cell reaction in a galvanic cell continues,

- A) E for the cell increases.
- B) E for the cell decreases.
- C)  $E^\circ$  for the cell increases.
- D)  $E^\circ$  for the cell decreases.

Answer: <https://biology-forums.com/index.php?topic=291137>

### Question 1776

To make a 3.0 M solution, one could take 3.00 moles of solute and add

- A) 1.00 L of solvent.
- B) 1.00 kg of solvent.
- C) enough solvent to make 1.00 L of solution.
- D) enough solvent to make 1.00 kg of solution.

Answer: <https://biology-forums.com/index.php?topic=290218>

### Question 1777

Which of the following ionic compounds would be expected to have the highest lattice energy?

- A) Li F
- B) Na F
- C) K F
- D) Rb F

Answer: <https://biology-forums.com/index.php?topic=289555>

### Question 1778

Which one of the following is an empirical formula?

- A) C<sub>2</sub>F<sub>6</sub>
- B) H<sub>2</sub>SO<sub>2</sub>
- C) C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>
- D) P<sub>4</sub>O<sub>10</sub>

Answer: <https://biology-forums.com/index.php?topic=289183>

### Question 1779

What is the general valence-electron ground-state electron configuration for neutral alkaline earth metals?

- A) ns<sup>1</sup>
- B) ns<sup>2</sup>
- C) 1s<sup>2</sup>2s<sup>2</sup>2p<sup>4</sup>
- D) 1s<sup>2</sup>2s<sup>2</sup>

Answer: <https://biology-forums.com/index.php?topic=289442>

### Question 1780

Which of the following is expected to have the greatest viscosity?

- A) C<sub>5</sub>H<sub>12</sub>
- B) C<sub>6</sub>H<sub>14</sub>
- C) C<sub>5</sub>H<sub>11</sub>OH
- D) CH<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=290075>

### Question 1781

In order to form a neutral compound, hexafluoroaluminate would require

- A) three Na<sup>+</sup> ions.
- B) three Br<sup>-</sup> ions.
- C) six K<sup>+</sup> ions.
- D) six I<sup>-</sup> ions.

Answer: <https://biology-forums.com/index.php?topic=291571>

### Question 1782

Convert 10,000 cm<sup>3</sup> to m<sup>3</sup>.

- A) 1 × 10<sup>-2</sup> m<sup>3</sup>
- B) 1 × 10<sup>2</sup> m<sup>3</sup>
- C) 1 × 10<sup>6</sup> m<sup>3</sup>
- D) 1 × 10<sup>10</sup> m<sup>3</sup>

Answer: <https://biology-forums.com/index.php?topic=288809>

### Question 1783

The element Bh has how many valence electrons?

- A) 2
- B) 5
- C) 7
- D) 1

Answer: <https://biology-forums.com/index.php?topic=289438>

### Question 1784

How many of the following numbers contain 3 significant figures?

0.105 5.600 0.0300  $7.00 \times 10^2$

- A) one
- B) two
- C) three
- D) four

Answer: <https://biology-forums.com/index.php?topic=288829>

### Question 1785

According to the Bohr model of the atom, when an electron goes from a higher-energy orbit to a lower-energy orbit, it \_\_\_\_\_ electromagnetic energy with an energy that is equal to the \_\_\_\_\_ between the two orbits.

Answer: <https://biology-forums.com/index.php?topic=289464>

### Question 1786

The dissociation equilibrium constants for the protonated form of alanine (a diprotic amino acid,  $H_2X^+$ ) are  $K_{a1} = 4.6 \times 10^{-3}$  and  $K_{a2} = 2.0 \times 10^{-10}$ . What is the pH of 50.00 mL of a 0.0500 M solution of alanine after 25.00 mL of 0.100 M NaOH has been added?

- A) 2.34
- B) 4.85
- C) 5.59
- D) 6.72

Answer: <https://biology-forums.com/index.php?topic=290866>

### Question 1787

The normal boiling point occurs when the

- A) intermolecular forces within the liquid phase are broken.
- B) temperature of the pure liquid equals the external temperature.
- C) vapor pressure of a pure liquid equals an external pressure of one atmosphere.
- D) vapor pressure of the liquid equals the external pressure.

Answer: <https://biology-forums.com/index.php?topic=290088>

### Question 1788

Based on the activity series, which metal dissolves in hydrochloric acid to produce hydrogen gas, but does not react with steam or liquid water?

- A) Mg
- B) Hg
- C) Sn
- D) K

Answer: <https://biology-forums.com/index.php?topic=289331>

### Question 1789

$SiO_2$  can be classified as a(n)

- A) amorphous solid.
- B) covalent network solid.
- C) ionic solid.
- D) molecular solid.

Answer: <https://biology-forums.com/index.php?topic=291776>

### Question 1790

The alkali metals K, Rb, and Cs are commercially produced by

- A) chemical reduction of their molten salts.
- B) electrolysis of their molten salts.
- C) thermal decomposition of their molten metal halides.
- D) thermal decomposition of their molten metal oxides.

Answer: <https://biology-forums.com/index.php?topic=291729>

### Question 1791

Molality is defined as moles of solute per

- A) kilogram of solvent.
- B) liter of solvent.
- C) mole of solvent.
- D) total moles present.

Answer: <https://biology-forums.com/index.php?topic=290297>

### Question 1792

Which one of the following has the lowest standard molar entropy,  $S^\circ$ , at 25°C?

- A) C<sub>5</sub>H<sub>12</sub>(s)
- B) C<sub>9</sub>H<sub>20</sub>(l)
- C) C<sub>12</sub>H<sub>26</sub>(s)
- D) C<sub>18</sub>H<sub>38</sub>(l)

Answer: <https://biology-forums.com/index.php?topic=291043>

### Question 1793

Of the following, which element has the highest first ionization energy?

- A) P
- B) N
- C) Sb
- D) As

Answer: <https://biology-forums.com/index.php?topic=289486>

### Question 1794

2-Propanol has the molecular formula C<sub>3</sub>H<sub>8</sub>O. Which ball and stick model shown above represents 2-propanol? [gray spheres = C, black spheres = O, unshaded spheres = H]

- A) model a)
- B) model b)
- C) model c)
- D) model d)

Answer: <https://biology-forums.com/index.php?topic=289127>

### Question 1795

As a liquid evaporates at a temperature below its boiling point, the temperature of the liquid

- A) decreases.
- B) decreases at low temperatures, but increases at high temperatures.
- C) increases.
- D) remains unchanged.

Answer: <https://biology-forums.com/index.php?topic=290085>

### Question 1796

The practical limit for <sup>14</sup>C dating occurs when its activity falls to 0.20% of its original value due to interference in detectors by natural background radiation. If the half-life is 5715 years, what is the maximum age of a sample that can be dated by <sup>14</sup>C without interference?

- A) 1.3 × 10<sup>4</sup> years
- B) 2.9 × 10<sup>4</sup> years
- C) 5.1 × 10<sup>4</sup> years
- D) 2.9 × 10<sup>6</sup> years

Answer: <https://biology-forums.com/index.php?topic=291415>

### Question 1797

Which compound contains only carbons and hydrogens?

- A) methyl ethanoate
- B) acetylene



- C) 2-butanone
- D) ethyl amine

Answer: <https://biology-forums.com/index.php?topic=291999>

### Question 1798

Barium has a radius of 224 pm and crystallizes in a body-centered cubic structure. What is the edge length of the unit cell?

- A) 259 pm
- B) 317 pm
- C) 448 pm
- D) 517 pm

Answer: <https://biology-forums.com/index.php?topic=290159>

### Question 1799

How many electrons are in the ground state of  $Tl^+$ ?

- A) 2
- B) 3
- C) 4
- D) 5

Answer: <https://biology-forums.com/index.php?topic=291553>

### Question 1800

Which is a third transition series element?

- A) B
- B) Mg
- C) Y
- D) Ta

Answer: <https://biology-forums.com/index.php?topic=291548>

### Question 1801

What two transition elements have the highest electrical conductivity of any elements at room temperature?

- A) copper and zinc
- B) copper and silver
- C) iron and gold
- D) silver and chromium

Answer: <https://biology-forums.com/index.php?topic=291554>

### Question 1802

A consistent explanation of known observations is called

- A) an experiment.
- B) a hypothesis.
- C) a prediction.
- D) a theory.

Answer: <https://biology-forums.com/index.php?topic=288730>

### Question 1803

What is the third-row element having the successive ionization energies in kJ/mol: 738, 1451, 7733, 10,540, 13,630, 17,995, 21,703?

Answer: <https://biology-forums.com/index.php?topic=289576>

### Question 1804

For the reaction  $H_2(g) + S(s) \rightleftharpoons H_2S(g)$ , if the rate constant for the forward reaction is greater than the rate constant for the reverse reaction, the value of  $K_c$  must be \_\_\_\_\_ (equal to, greater than, less than) 1.

Answer: <https://biology-forums.com/index.php?topic=290604>

### Question 1805

Calculate the hydronium ion concentration in an aqueous solution that contains  $2.50 \times 10^{-4}$  M in hydroxide ion.

- A)  $4.00 \times 10^{-9}$  M
- B)  $4.00 \times 10^{-10}$  M
- C)  $4.00 \times 10^{-11}$  M
- D)  $5.00 \times 10^{-11}$  M

Answer: <https://biology-forums.com/index.php?topic=290651>

### Question 1806

A sievert is

- A) the amount of sample that undergoes 1 disintegration per second.
- B) the amount of sample that undergoes  $3.7 \times 10^{10}$  disintegrations per second.
- C) the amount of tissue damage done by radiation.
- D) equal to 0.01 J of energy absorbed per kilogram of tissue.

Answer: <https://biology-forums.com/index.php?topic=291397>

### Question 1807

Which has the smallest dipole-dipole forces?

- A) CH<sub>3</sub>Cl
- B) KCN
- C) I<sub>2</sub>
- D) H<sub>2</sub>S

Answer: <https://biology-forums.com/index.php?topic=289744>

### Question 1808

Cr<sup>2+</sup> has \_\_\_\_\_ d electrons.

Answer: <https://biology-forums.com/index.php?topic=291582>

### Question 1809

Which acid has the smallest value of K<sub>a</sub>?

- A) HX
- B) HY
- C) HZ
- D) All have the same K<sub>a</sub> value.

Answer: <https://biology-forums.com/index.php?topic=290726>

### Question 1810

Ethyl chloride, C<sub>2</sub>H<sub>5</sub>Cl, is used as a local anesthetic. It works by cooling tissue as it vaporizes; its heat of vaporization is 26.4 kJ/mol. How much heat could be removed by 10.0 g of ethyl chloride?

- A) 4.09 kJ
- B) 170 kJ
- C) 264 kJ
- D) 1700 kJ

Answer: <https://biology-forums.com/index.php?topic=290136>

### Question 1811

Which one of the following instruments would be the least suitable for detecting particles given off in radioactive decay?

- A) electron microscope
- B) Geiger counter
- C) photographic film
- D) scintillation counter

Answer: <https://biology-forums.com/index.php?topic=291393>

### Question 1812

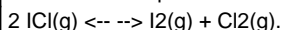
Mass defect is the mass lost when

- A) an atom is formed from individual protons, neutrons, and electrons.
- B) a nucleus is formed from individual protons and neutrons.
- C) electrons are removed from an atom.
- D) electrons are added to an atom.

Answer: <https://biology-forums.com/index.php?topic=291364>

### Question 1813

At a certain temperature the equilibrium constant, K<sub>c</sub>, equals 0.11 for the reaction:



What is the equilibrium concentration of ICl if 0.65 mol of I<sub>2</sub> and 0.65 mol of Cl<sub>2</sub> are initially mixed in a 2.0-L flask?

- A) 0.20 M
- B) 0.24 M
- C) 0.39 M
- D) 0.49 M

Answer: <https://biology-forums.com/index.php?topic=290581>

### Question 1814

Aluminum is an example of

- A) a compound.
- B) an element.
- C) a mixture.
- D) an ion.

Answer: <https://biology-forums.com/index.php?topic=288991>

### Question 1815

Which pair of ions can be separated by the addition of sulfide ion?

- A)  $\text{Na}^+$  and  $\text{Fe}^{2+}$
- B)  $\text{Cu}^{2+}$  and  $\text{Bi}^{3+}$
- C)  $\text{Pb}^{2+}$  and  $\text{Ba}^{2+}$
- D)  $\text{Ca}^{2+}$  and  $\text{Ba}^{2+}$

Answer: <https://biology-forums.com/index.php?topic=290932>

### Question 1816

Methane and oxygen react to form carbon dioxide and water. What mass of water is formed if 3.2 g of methane reacts with 12.8 g of oxygen to produce 8.8 g of carbon dioxide?

- A) 7.2 g
- B) 8.8 g
- C) 14.8 g
- D) 16.0 g

Answer: <https://biology-forums.com/index.php?topic=288878>

### Question 1817

If a constant current of  $1.50 \times 10^8$  A is passed through a molten mixture of aluminum oxide and cryolite for 4.00 hour \_\_\_\_\_ kg of aluminum can be produced.

Answer: <https://biology-forums.com/index.php?topic=291311>

### Question 1818

The compound  $\text{ICl}_3$  contains

- A) ionic bonds.
- B) nonpolar covalent bonds.
- C) polar covalent bonds with partial negative charges on the Cl atoms.
- D) polar covalent bonds with partial negative charges on the I atoms.

Answer: <https://biology-forums.com/index.php?topic=289626>

### Question 1819

Which part of the Arrhenius equation contains a term which measures the number of molecules that have the correct orientation for reaction?

- A) activation energy
- B)  $e^{-E_a/RT}$
- C) frequency factor
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=290395>

### Question 1820

What geometric arrangement of charge clouds is expected for an atom that has five charge clouds?

- A) tetrahedral
- B) square planar
- C) trigonal bipyramidal
- D) octahedral

Answer: <https://biology-forums.com/index.php?topic=289719>

### Question 1821

In which compound is the oxidation state of hydrogen not +1?

- A) H<sub>2</sub>S
- B) H<sub>2</sub>O<sub>2</sub>
- C) KH
- D) KHSO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289325>

### Question 1822

Nuclei that are in the band of stability have a neutron/proton ratio \_\_\_\_\_ (equal to, greater than, less than) 1:1.

Answer: <https://biology-forums.com/index.php?topic=291461>

### Question 1823

Based on the variation in  $Z_{eff}$ , which M<sup>2+</sup> ion should be the weakest reducing agent?

- A) Ti
- B) Cr
- C) Fe
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291532>

### Question 1824

The acid strength of an oxoacid having the general formula H<sub>n</sub>YO<sub>m</sub> increases as the electronegativity of Y \_\_\_\_\_ and as the oxidation number of Y \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290823>

### Question 1825

Ionic compounds consist of a single three-dimensional network of ions that are attracted to one another by strong \_\_\_\_\_ and usually exist in the solid state at room temperature, whereas covalent compounds consist of molecules that are attracted to one another by weak \_\_\_\_\_ and can exist in gaseous, liquid, or solid state at room temperature.

Answer: <https://biology-forums.com/index.php?topic=289655>

### Question 1826

In which of the following solutions would solid PbBr<sub>2</sub> be expected to be the least soluble at 25°C?

- A) 0.1 M HBr
- B) 0.1 M LiBr
- C) 0.1 M CaBr<sub>2</sub>
- D) 0.1 M LiNO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290928>

### Question 1827

What is the compound responsible for the green patina seen on bronze monuments?

- A) CuCO<sub>3</sub>
- B) Cu<sub>2</sub>(OH) CO<sub>3</sub>
- C) Cu(OH)
- D) Cu<sub>2</sub>(OH)<sub>2</sub>SO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=291563>

### Question 1828

Which law does the equation,  $= k$  represent?

- A) Avogadro's law
- B) Boyle's law
- C) Charles' law
- D) Graham's law

Answer: <https://biology-forums.com/index.php?topic=289924>

### Question 1829

What is the chemical process most likely to be used to purify nickel metal?

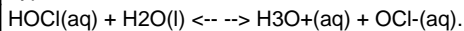
- A) distillation

- B) electrorefining
- C) reaction with carbon monoxide (a Mond process)
- D) reaction with iodine

Answer: <https://biology-forums.com/index.php?topic=291608>

### Question 1830

What is the hydronium ion concentration of a 0.100 M hypochlorous acid solution with  $K_a = 3.5 \times 10^{-8}$ ? The equation for the dissociation of hypochlorous acid is:



- A)  $1.9 \times 10^{-4}$
- B)  $5.9 \times 10^{-4}$
- C)  $1.9 \times 10^{-5}$
- D)  $5.9 \times 10^{-5}$

Answer: <https://biology-forums.com/index.php?topic=290688>

### Question 1831

A solution may contain the following ions  $\text{Ag}^+$ ,  $\text{Cu}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Ni}^{2+}$  and  $\text{Na}^+$ . A white precipitate formed when 0.10 M NaCl was added and after this was removed the solution was treated with  $\text{H}_2\text{S}$  gas under acidic conditions and no precipitate formed. When the solution was made basic and again treated with  $\text{H}_2\text{S}$  gas a dark colored precipitate formed. If no further tests were made then what conclusions can you draw?

- A) possible ions present  $\text{Ag}^+$ ,  $\text{Mn}^{2+}$ ,  $\text{Ni}^{2+}$
- B) possible ions present  $\text{Ag}^+$ ,  $\text{Mn}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Na}^+$
- C) possible ions present  $\text{Ag}^+$ ,  $\text{Cu}^{2+}$ ,  $\text{Cd}^{2+}$
- D) possible ions present  $\text{Ag}^+$ ,  $\text{Cu}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Na}^+$

Answer: <https://biology-forums.com/index.php?topic=290882>

### Question 1832

Gamma radiation can be described as

- A) a helium nucleus.
- B) a negatively charged free electron.
- C) high energy electromagnetic radiation.
- D) a positively charged free electron.

Answer: <https://biology-forums.com/index.php?topic=291334>

### Question 1833

Which of the following is the correct chemical formula for a molecule of nitrogen?

- A) N
- B) N<sup>-</sup>
- C) N<sup>+</sup>
- D) N<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289026>

### Question 1834

Which of the following species has the electron configuration  $[\text{Ar}]3d^3$ ?

- A) Sc
- B) V<sup>3+</sup>
- C) Cr<sup>3+</sup>
- D) Fe<sup>3+</sup>

Answer: <https://biology-forums.com/index.php?topic=291547>

### Question 1835

How does one commercially reduce the metal oxides or chlorides of sodium and magnesium?

- A) electrolysis of the molten salts
- B) high temperature reduction with aluminum
- C) high temperature reduction with carbon
- D) roasting

Answer: <https://biology-forums.com/index.php?topic=291607>

### Question 1836

The small sizes of third transition series atoms is referred to as the \_\_\_\_\_ contraction.

Answer: <https://biology-forums.com/index.php?topic=291586>

### Question 1837

Which of the following terms can be used to describe an electrochemical cell in which a spontaneous chemical reaction generates an electric current?

- I. an electrolytic cell
- II. a galvanic cell
- III. a voltaic cell

- A) only I
- B) only II
- C) only III
- D) II and III

Answer: <https://biology-forums.com/index.php?topic=291089>

### Question 1838

How many chloride ions are there in 3.00 mol of aluminum chloride?

- A) 3.00 chloride ions
- B) 9.00 chloride ions
- C)  $1.81 \times 10^{24}$  chloride ions
- D)  $5.42 \times 10^{24}$  chloride ions

Answer: <https://biology-forums.com/index.php?topic=289136>

### Question 1839

Which ion has the same electron configuration as Kr?

- A) Rb+
- B) Br-
- C) Se<sup>2-</sup>
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=289476>

### Question 1840

What is the identity of M in the hydrate  $M(H_2O)_6n+$  that has the 0.10 M solution with the lowest pH?

- A) Li+
- B) Na+
- C) Mg<sup>2+</sup>
- D) Al<sup>3+</sup>

Answer: <https://biology-forums.com/index.php?topic=290719>

### Question 1841

A catalyst increases the rate of a chemical reaction by providing a lower-energy mechanism for the reaction. When this occurs, which one of the following is not affected?

- A) activation energy for the forward reaction
- B) activation energy for the reverse reaction
- C) equilibrium constant
- D) rate of the reverse reaction

Answer: <https://biology-forums.com/index.php?topic=290558>

### Question 1842

Which statement concerning overvoltage is false?

- A) Overvoltage is the additional voltage above the calculated voltage required to bring about electrolysis.
- B) Overvoltage is often due to a high activation energy for the reaction at one electrode.
- C) Overvoltage is small for half-reactions involving the formation of O<sub>2</sub>(g) or H<sub>2</sub>(g).
- D) Overvoltage must be experimentally determined.

Answer: <https://biology-forums.com/index.php?topic=291161>

### Question 1843

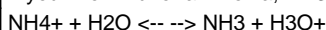
In leu-ala-arg-val-tyr-his-pro-gln, the amino acid with the N-terminal is

- A) gln.
- B) val.
- C) leu.
- D) tyr.

Answer: <https://biology-forums.com/index.php?topic=292041>

### Question 1844

If you know  $K_b$  for ammonia,  $\text{NH}_3$ , you can calculate the equilibrium constant,  $K_a$ , for the following reaction:



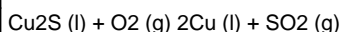
using the equation:

- A)  $K_a = K_w \times K_b$
- B)  $K_a = K_w / K_b$
- C)  $K_a = 1 / K_b$
- D)  $K_a = K_b / K_w$

Answer: <https://biology-forums.com/index.php?topic=290712>

### Question 1845

How many kilograms of copper sulfide must be reduced to produce  $3.20 \times 10^{10}$  kg of Cu? The reduction of copper proceeds via the following reaction.



- A)  $3.20 \times 10^{13}$  kg
- B)  $4.0 \times 10^{12}$  kg
- C)  $6.4 \times 10^{10}$  kg
- D)  $1.3 \times 10^{11}$  kg

Answer: <https://biology-forums.com/index.php?topic=291670>

### Question 1846

Name the product of hydrogenation of trans-2-pentene.

- A) pentane
- B) cis-2-pentene
- C) trans-2-pentane
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=291946>

### Question 1847

Which element will not react with liquid water but will react with aqueous  $\text{H}^+$  ions and steam?

- A) K
- B) Fe
- C) Sn
- D) Hg

Answer: <https://biology-forums.com/index.php?topic=289333>

### Question 1848

Phosphate ion has the formula \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289063>

### Question 1849

In which set do all elements tend to form anions in binary ionic compounds?

- A) C, S, Pb
- B) K, Fe, F
- C) Na, Ba, Al
- D) N, O, Cl

Answer: <https://biology-forums.com/index.php?topic=289021>

### Question 1850

How many alpha amino acids commonly make up the different proteins found in humans?

- A) 6
- B) 20
- C) 22
- D) 12

Answer: <https://biology-forums.com/index.php?topic=292031>

### Question 1851

The cycloalkane represented by a heptagon is named \_\_\_\_\_ and has the molecular formula \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292060>

### Question 1852

What is the hybridization of boron in diborane B<sub>2</sub>H<sub>6</sub>?

- A) sp
- B) sp<sup>2</sup>
- C) sp<sup>3</sup>
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=291747>

### Question 1853

Element M has the valence electron configuration 3d<sup>6</sup> 4s<sup>2</sup>. What is the valence electron configuration of the M<sup>3+</sup> ion?

- A) 3d<sup>5</sup>
- B) 3d<sup>3</sup> 4s<sup>2</sup>
- C) 3d<sup>4</sup> 4s<sup>1</sup>
- D) 3d<sup>9</sup> 4s<sup>2</sup>

Answer: <https://biology-forums.com/index.php?topic=291484>

### Question 1854

At 80.0°C heptane, C<sub>7</sub>H<sub>16</sub>, has a vapor pressure of 428 mm Hg and octane, C<sub>8</sub>H<sub>18</sub>, has a vapor pressure of 175 mm Hg. What is the vapor pressure of a solution that contains 20.0 g C<sub>7</sub>H<sub>16</sub> and 11.4 g C<sub>8</sub>H<sub>18</sub>?

Answer: <https://biology-forums.com/index.php?topic=290339>

### Question 1855

Volume is a derived unit having the unit length<sup>x</sup>, where x = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=288851>

### Question 1856

A radioisotope has a neutron/proton ratio which is too low. Which of the following processes will not occur for such a nucleus?

- A) alpha emission
- B) beta emission
- C) electron capture
- D) positron emission

Answer: <https://biology-forums.com/index.php?topic=291351>

### Question 1857

Fuel cells

- A) produce carbon dioxide and hydrogen.
- B) emit sulfur oxides.
- C) are environmentally clean.
- D) cannot be used in vehicles.

Answer: <https://biology-forums.com/index.php?topic=291175>

### Question 1858

The symbol of the isotope having Z = 88 and A = 226 is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289051>

### Question 1859

The bonding in NaI is \_\_\_\_\_, whereas the bonding in NH<sub>3</sub> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289062>

### Question 1860

When silver nitrate reacts with barium chloride, silver chloride and barium nitrate are formed. How many grams of silver chloride are formed when 8.0 g of silver nitrate reacts with 15.0 g of barium chloride?

- A) 6.752 g
- B) 9.40 g
- C) 11.9 g
- D) 18.8 g

Answer: <https://biology-forums.com/index.php?topic=289106>



### Question 1861

The condensed formula of the smallest molecule that contains the ether functional group is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=292052>

### Question 1862

Which one of the following processes does not result in transmutation to another element?

- A) alpha emission
- B) positron decay
- C) electron capture
- D) gamma emission

Answer: <https://biology-forums.com/index.php?topic=291428>

### Question 1863

A student left 40.0 mL of a bottle of 12.0 M HCl out overnight. The next morning, the bottle has only 35.7 mL of liquid left. Assuming that the volume change is only due to loss of water, what will be the molarity if the remaining solution is diluted to 150 mL?

- A) 6.0 M
- B) 2.86 M
- C) 3.20 M
- D) 12.0 M

Answer: <https://biology-forums.com/index.php?topic=289286>

### Question 1864

Who discovered the phenomenon of superconductivity in 1911?

- A) J. G. Bednorz
- B) R. B. Fuller
- C) K. A. Müller
- D) H. K. Onnes

Answer: <https://biology-forums.com/index.php?topic=291640>

### Question 1865

Erythromycin is a basic antimicrobial with  $pK_b = 5.2$ . A  $1.0 \times 10^{-3}$  M solution of erythromycin has a pH of \_\_\_\_\_ and a \_\_\_\_\_ percent ionization.

Answer: <https://biology-forums.com/index.php?topic=290820>

### Question 1866

The charge to mass ratio of an electron was determined from Rutherford's cathode-ray tube experiment to be  $1.759 \times 10^8$  C/g and the charge on a single electron was determined from the Millikan oil drop experiment to be  $1.602 \times 10^{-19}$  C, so the mass of a single electron is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289049>

### Question 1867

Three atoms have the following properties.

Proton Neutron Electron  
Atom X 119 119 119  
Atom Y 119 119 118  
Atom Z 118 118 119

Which of the following statements is true?

- A) Element Y and Z are isotopes of X.
- B) Element Y is an isotope of Z.
- C) Element Y is an ion of X.
- D) Element Z is an ion of Y.

Answer: <https://biology-forums.com/index.php?topic=288903>

### Question 1868

In most liquid solutions, the component present in the larger amount is called the

- A) dispersed medium.
- B) emulsifying agent.
- C) solute.
- D) solvent.

Answer: <https://biology-forums.com/index.php?topic=290185>

### Question 1869

What is the pH of a buffer system made by dissolving 10.70 grams of  $\text{NH}_4\text{Cl}$  and 20.00 mL of 12.0 M  $\text{NH}_3$  in enough water to make 1.000 L of solution?  $K_b = 1.8 \times 10^{-5}$  for  $\text{NH}_3$ .

- A) 9.18
- B) 9.26
- C) 9.34
- D) 11.03

Answer: <https://biology-forums.com/index.php?topic=290834>

### Question 1870

In the mixed aluminum-boron hydride  $\text{AlBH}_6$ , the number of hydrogen involved in 2c-2e bonds is \_\_\_\_\_, and the number of hydrogen involved in 3c-2e bonds is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291909>

### Question 1871

Which one of the following binary oxides is the most basic?

- A)  $\text{B}_2\text{O}_3$
- B)  $\text{Al}_2\text{O}_3$
- C)  $\text{Ga}_2\text{O}_3$
- D)  $\text{In}_2\text{O}_3$

Answer: <https://biology-forums.com/index.php?topic=291806>

### Question 1872

The masses of  $4\text{He}$ ,  $6\text{Li}$ , and  $10\text{B}$  are 4.0015, 6.0135, and 10.0102 amu respectively. The fission of a boron-10 nucleus into  $\text{He-4}$  and  $\text{Li-6}$  would

- A) absorb energy.
- B) evolve energy.
- C) result in no energy change.
- D) Need more information

Answer: <https://biology-forums.com/index.php?topic=291386>

### Question 1873

Identify the set of Lewis acids.

- A)  $\text{BH}_3$ ,  $\text{BF}_3$ ,  $\text{Cu}^{2+}$ ,  $\text{CO}_2$
- B)  $\text{Cl}^-$ ,  $\text{OH}^-$ ,  $\text{NBr}_3$ ,  $\text{H}_2\text{O}$
- C)  $\text{H}_3\text{PO}_4$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{HPO}_4^{2-}$ ,  $\text{PO}_4^{3-}$
- D)  $\text{CCl}_3^-$ ,  $\text{NH}_2^-$ ,  $\text{CN}^-$ ,  $\text{F}^-$

Answer: <https://biology-forums.com/index.php?topic=290800>

### Question 1874

The partial pressures of  $\text{CH}_4$ ,  $\text{N}_2$ , and  $\text{O}_2$  in a sample of gas were found to be 143 mmHg, 469 mmHg, and 251 mmHg, respectively. Calculate the mole fraction of oxygen.

- A) 0.410
- B) 0.291
- C) 2.44
- D) 22.4

Answer: <https://biology-forums.com/index.php?topic=290028>

### Question 1875

Layers of atoms having a spacing of 105 pm will diffract X-rays with  $d = 154.2$  pm at an angle of \_\_\_\_\_ degrees.

Answer: <https://biology-forums.com/index.php?topic=290176>

### Question 1876

The solid compound,  $\text{Na}_4\text{SiO}_4$ , contains

- A)  $\text{Na}^+$ ,  $\text{Si}^{4+}$ , and  $\text{O}^{2-}$  ions.
- B)  $\text{Na}^+$  ions and  $\text{SiO}_4^{4-}$  ions.
- C)  $\text{Na}_4^+$  and  $\text{SiO}_4^{4-}$  ions.
- D)  $\text{Na}_4\text{SiO}_4$  molecules.

Answer: <https://biology-forums.com/index.php?topic=289008>

### Question 1877

Binary oxides can be classified as acidic, amphoteric, or basic. MgO, Al<sub>2</sub>O<sub>3</sub>, and SO<sub>3</sub> are classified as \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ oxides, respectively.

Answer: <https://biology-forums.com/index.php?topic=291927>

### Question 1878

What is the H-C-H bond angle?

- A) 90°
- B) 109.5°
- C) 120°
- D) 180°

Answer: <https://biology-forums.com/index.php?topic=291982>

### Question 1879

Which of the following does not affect the solubility of a solute in a given solvent?

- A) hydrogen bonding of the solute
- B) nonpolarity of the solvent
- C) rate of stirring
- D) temperature of the solvent and solute

Answer: <https://biology-forums.com/index.php?topic=290305>

### Question 1880

A reaction is second order in NO and first order in O<sub>2</sub> has a rate constant,  $k = 1.4 \times 10^4 \text{ M}^{-2}\text{s}^{-1}$ . What is the initial rate of reaction when the concentrations of NO and O<sub>2</sub> are 0.015 M and 0.030 M, respectively?

Answer: <https://biology-forums.com/index.php?topic=290469>

### Question 1881

How many distinct isomers can be drawn for a molecule of C<sub>4</sub>H<sub>8</sub>?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=291961>

### Question 1882

What is the strongest acid among the following?

- A) HIO
- B) HIO<sub>2</sub>
- C) HIO<sub>3</sub>
- D) HIO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=290747>

### Question 1883

What is the pH of a solution made by mixing 5.00 mL of 0.10 M acetic acid with 5.00 mL of 0.10 M KOH? Assume that the volumes of the solutions are additive.  $K_a = 1.8 \times 10^{-5}$  for CH<sub>3</sub>CO<sub>2</sub>H.

- A) 5.28
- B) 7.00
- C) 8.72
- D) 10.02

Answer: <https://biology-forums.com/index.php?topic=290909>

### Question 1884

A college runner set a school record of 3:59.37 in the mile run. Assuming that the distance was measured accurately to five significant figures, what was the runner's average speed in kilometers per hour?

- A) 9.3454 km/hr
- B) 10.375 km/hr
- C) 24.203 km/hr

D) 26.869 km/hr

Answer: <https://biology-forums.com/index.php?topic=288775>

### Question 1885

Main-group elements are those elements in groups \_\_\_\_\_ through \_\_\_\_\_ of the periodic table.

Answer: <https://biology-forums.com/index.php?topic=291901>

### Question 1886

According to the Balmer-Rydberg equation, the transition from  $n = 6$  to  $m = 2$  results in a spectral line having which color?

- A) blue
- B) blue-green
- C) indigo
- D) red

Answer: <https://biology-forums.com/index.php?topic=289366>

### Question 1887

Approximately 90% of the Earth's crust is composed of what type of compounds?

- A) carbonates
- B) oxides
- C) silicates
- D) sulfates

Answer: <https://biology-forums.com/index.php?topic=291881>

### Question 1888

Which of the following statements about electron capture is false?

- A) The electron is used to convert a proton to a neutron.
- B) The electron involved is most likely an outer shell valence electron.
- C) In electron capture decay, the atomic number decreases by one.
- D) In electron capture decay, the mass number remains unchanged.

Answer: <https://biology-forums.com/index.php?topic=291338>

### Question 1889

Beta decay of  $^{24}\text{Na}$  produces a beta particle and

- A)  $^{20}\text{F}$ .
- B)  $^{23}\text{Na}$ .
- C)  $^{24}\text{Ne}$ .
- D)  $^{24}\text{Mg}$ .

Answer: <https://biology-forums.com/index.php?topic=291321>

### Question 1890

Which of the following can function as a bidentate ligand?

- A)  $\text{NH}_3$
- B)  $\text{CN}^-$
- C)  $\text{N}_3^-$
- D)  $\text{C}_2\text{O}_4^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291567>

### Question 1891

Some assumptions from the kinetic molecular theory are listed below. Which one is most frequently cited to explain diffusion of a gas?

- A) The average kinetic energy of gas particles is proportional to the Kelvin temperature.
- B) Collisions of gas particles are elastic and total kinetic energy of the gas is constant.
- C) A gas consist of tiny particles moving in random straight line motion.
- D) The volume of the particles is negligible compared to the volume of the gas.

Answer: <https://biology-forums.com/index.php?topic=289966>

### Question 1892

Cytosine is a base that occurs in \_\_\_\_\_ (DNA, RNA, DNA and RNA).

Answer: <https://biology-forums.com/index.php?topic=292066>

### Question 1893

The rate constant,  $k$ , for a first-order reaction is equal to  $6.2 \times 10^{-4} \text{ s}^{-1}$ . What is the half-life for the reaction?

- A)  $4.3 \times 10^{-4} \text{ s}$
- B)  $8.0 \times 10^2 \text{ s}$
- C)  $1.1 \times 10^3 \text{ s}$
- D)  $1.6 \times 10^3 \text{ s}$

Answer: <https://biology-forums.com/index.php?topic=290438>

### Question 1894

Of  $\text{C}_2\text{H}_5\text{OH}$  and  $\text{C}_3\text{H}_5(\text{OH})_3$  the one expected to have the higher viscosity is \_\_\_\_\_, and the one expected to have the higher surface tension is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290169>

### Question 1895

The rubbing alcohol sold in drug stores often is composed of 70% isopropyl alcohol and 30% water. In this solution

- A) isopropyl alcohol is the solvent.
- B) water is the solvent.
- C) both water and isopropyl alcohol are solvents.
- D) neither water nor isopropyl alcohol is a solvent.

Answer: <https://biology-forums.com/index.php?topic=290186>

### Question 1896

Which of the following titrations result in an acidic solution at the equivalence point?

- A)  $\text{CH}_3\text{COOH}$  titrated with  $\text{LiOH}$
- B)  $\text{NaF}$  titrated with  $\text{LiOH}$
- C)  $\text{HBr}$  titrated with  $\text{KOH}$
- D)  $\text{C}_5\text{H}_5\text{N}$  titrated with  $\text{HCl}$

Answer: <https://biology-forums.com/index.php?topic=290915>

### Question 1897

The average osmotic pressure of blood is about 7 atm. Therefore

- A) the average blood pressure is about 7 atm.
- B) the average pressure inside the body is about 7 atm above the external pressure.
- C) a pressure of about 7 atm would be required to prevent osmosis if blood is in contact with pure water across a semipermeable membrane.
- D) All of these are true.

Answer: <https://biology-forums.com/index.php?topic=290261>

### Question 1898

Which is an amino acid acidic side chain?

- A)  $-\text{CH}_3$
- B)  $-\text{CH}_2\text{OH}$
- C)  $-\text{CH}_2\text{CO}_2\text{H}$
- D)  $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$

Answer: <https://biology-forums.com/index.php?topic=291975>

### Question 1899

At 300 K a 500.0 mL solution containing 0.4314 g of dextrose has an osmotic pressure of 89.6 mm Hg. What is the molar mass of dextrose?

Answer: <https://biology-forums.com/index.php?topic=290348>

### Question 1900

A complex ion that has a broad absorption band at 530 nm in its visible absorption spectrum will appear to be

- A) red.
- B) colorless.
- C) green.
- D) aqua.

Answer: <https://biology-forums.com/index.php?topic=291574>

### Question 1901

The normal boiling point for HBr is higher than the normal boiling point for HCl. This can be explained by

- A) larger dipole-dipole forces for HBr.
- B) larger dispersion forces for HBr.
- C) larger hydrogen-bond forces for HBr.
- D) larger dipole-dipole forces, larger dispersion forces, and larger hydrogen-bond forces for HBr.

Answer: <https://biology-forums.com/index.php?topic=290090>

### Question 1902

What is the approximate carbon-oxygen bond order in CO<sub>3</sub><sup>2-</sup>?

- A) 2
- B) 4/3
- C) 5/3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=289644>

### Question 1903

If K<sub>c</sub> equals 0.110 at 25°C for the reaction: N<sub>2</sub>O<sub>4</sub>(g)  $\rightleftharpoons$  2 NO<sub>2</sub>(g), what is K<sub>c</sub> for the reaction: 6NO<sub>2</sub>(g)  $\rightleftharpoons$  3 N<sub>2</sub>O<sub>4</sub>(g)?

- A) 1.3 × 10<sup>-3</sup>
- B) 751
- C) 7.5
- D) 0.11

Answer: <https://biology-forums.com/index.php?topic=290568>

### Question 1904

At 298 K, K<sub>c</sub> = 1.7 × 10<sup>-56</sup> for the reaction 3 O<sub>2</sub>(g)  $\rightleftharpoons$  2 O<sub>3</sub>(g). What is the value of K<sub>p</sub> at this temperature?

Answer: <https://biology-forums.com/index.php?topic=290609>

### Question 1905

What is the Meissner effect associated with superconductors? It is

- A) when the temperature above which the superconductor fails to work.
- B) when the temperature at which the superconductors become perfect insulators.
- C) when the net magnetic field within the bulk of the superconductor is zero.
- D) when the net magnetic field within the bulk of the superconductor becomes nearly infinite.

Answer: <https://biology-forums.com/index.php?topic=291642>

### Question 1906

Which one of the following is not an empirical formula?

- A) CHO
- B) CH<sub>2</sub>O
- C) C<sub>2</sub>H<sub>4</sub>O
- D) C<sub>2</sub>H<sub>2</sub>O<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289181>

### Question 1907

A common rule in organic chemistry is that increasing the temperature of a reaction at room temperature by 10°C doubles the rate. Calculate E<sub>a</sub> for a reaction that follows this rule. Assume room temperature is 25°C.

- A) 0.576 kJ
- B) 12.2 kJ
- C) 38.4 kJ
- D) 52.9 kJ

Answer: <https://biology-forums.com/index.php?topic=290393>

### Question 1908

The fraction of collisions with sufficient energy to react is equal to

- A) A.
- B) E<sub>a</sub>.
- C) e<sup>-E<sub>a</sub>/RT</sup>.
- D) p.

Answer: <https://biology-forums.com/index.php?topic=290391>

### Question 1909

How many unpaired electrons are there in the ground state of element N?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=289429>

### Question 1910

A piece of metal ore weighs 8.50 g. When a student places it into a graduated cylinder containing water, the liquid level rises from 21.25 mL to 26.47 mL. What is the density of the ore?

- A) 0.321 g/mL
- B) 0.614 g/mL
- C) 1.63 g/mL
- D) 3.11 g/mL

Answer: <https://biology-forums.com/index.php?topic=288815>

### Question 1911

In which set do all elements tend to form cations in binary ionic compounds?

- A) Li, B, O
- B) Mg, Cr, Pb
- C) N, As, Bi
- D) O, F, Cl

Answer: <https://biology-forums.com/index.php?topic=288993>

### Question 1912

Which element has the highest first electron affinity?

- A) Fr
- B) Ra
- C) Po
- D) Rn

Answer: <https://biology-forums.com/index.php?topic=289543>

### Question 1913

According to the kinetic molecular theory of gases, at 290 K the average kinetic energy of O<sub>2</sub> is \_\_\_\_\_ the average kinetic energy of NO<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=290063>

### Question 1914

Refrigeration and air conditioning are a source of greenhouse gases such as

- A) CHClF<sub>2</sub>.
- B) Ne.
- C) HBr.
- D) H<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=290046>

### Question 1915

All of the following elements are nonmetals except

- A) beryllium.
- B) carbon.
- C) hydrogen.
- D) oxygen.

Answer: <https://biology-forums.com/index.php?topic=288955>

### Question 1916

Which molecule has the weakest bonds?

- A) CF<sub>4</sub>
- B) CCl<sub>4</sub>
- C) CBr<sub>4</sub>

D) Cl<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=289586>

### Question 1917

Which element will react rapidly with aqueous H<sup>+</sup> ions and also with liquid H<sub>2</sub>O?

- A) Pt
- B) Co
- C) Zn
- D) Ca

Answer: <https://biology-forums.com/index.php?topic=289332>

### Question 1918

The temperature and pressure at which all three phases can coexist in equilibrium is

- A) 0.25 atm and 110°C.
- B) 1.0 atm and 140°C.
- C) 1.25 atm and 300°C.
- D) 0.45 atm and 130°C.

Answer: <https://biology-forums.com/index.php?topic=290127>

### Question 1919

Which statement about nuclear reactions is true?

- A) New elements are never produced in a nuclear reaction.
- B) Nuclear reactions involve valence electrons.
- C) The rate of a nuclear reaction is affected by catalysts.
- D) Tremendous amounts of energy are involved in nuclear reactions.

Answer: <https://biology-forums.com/index.php?topic=291312>

### Question 1920

Adenosine triphosphate (ATP) plays an important role in energy transfer within cells. ATP can be considered to be an ester of triphosphoric acid, which is formed by the combination of three phosphoric acid molecules with the elimination of two water molecules. What is the formula of triphosphoric acid?

Answer: <https://biology-forums.com/index.php?topic=291925>

### Question 1921

Hydrochloric acid is an example of

- A) a compound.
- B) an element.
- C) an ion.
- D) a mixture.

Answer: <https://biology-forums.com/index.php?topic=288986>

### Question 1922

Which of the following contains an atom that does not obey the octet rule?

- A) NaCl
- B) SiO<sub>2</sub>
- C) BrF<sub>3</sub>
- D) BrF

Answer: <https://biology-forums.com/index.php?topic=289638>

### Question 1923

An atom can be seen by

- A) an atomic force microscope.
- B) a nucleon microscope.
- C) an optical microscope.
- D) a telescope.

Answer: <https://biology-forums.com/index.php?topic=288842>

### Question 1924

A cake is an example of



- A) a compound.
- B) an element.
- C) mixture.
- D) an anion.

Answer: <https://biology-forums.com/index.php?topic=288989>

### Question 1925

The number of cm in 1.0 in is closest to

- A) 1.0.
- B) 1.5.
- C) 2.0.
- D) 2.5.

Answer: <https://biology-forums.com/index.php?topic=288743>

### Question 1926

Which of the following compounds exhibits hydrogen bonding?

- A) CH<sub>3</sub>I
- B) HI
- C) CH<sub>3</sub>OCH<sub>3</sub>
- D) CH<sub>3</sub>NH<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289749>

### Question 1927

What is the most metallic element of group 5A?

- A) P
- B) As
- C) Sb
- D) Bi

Answer: <https://biology-forums.com/index.php?topic=291840>

### Question 1928

How many orbitals are there in the sixth shell?

- A) 5
- B) 6
- C) 15
- D) 36

Answer: <https://biology-forums.com/index.php?topic=289421>

### Question 1929

Which one of the following salts, when dissolved in water, produces the solution with the lowest pH?

- A) NaI
- B) KI
- C) MgI<sub>2</sub>
- D) AlI<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290793>

### Question 1930

Which has the most negative standard oxidation potential?

- A) Sc
- B) V
- C) Cu
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291530>

### Question 1931

What reagent would distinguish between Ba<sup>2+</sup> and Pb<sup>2+</sup>?

- A) KCl
- B) LiNO<sub>3</sub>
- C) K<sub>2</sub>SO<sub>4</sub>
- D) Li<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=289302>

### Question 1932

The decomposition of ammonia is:  $2 \text{NH}_3(\text{g}) \rightleftharpoons \text{N}_2(\text{g}) + 3 \text{H}_2(\text{g})$ . If the partial pressure of ammonia is  $1.60 \times 10^{-3}$  atm and the partial pressures of  $\text{N}_2$  and  $\text{H}_2$  are each 0.250 atm at equilibrium, what is the value for  $K_c$  at  $400^\circ\text{C}$  for the forward reaction?

- A) 0.500
- B) 1.00
- C)  $1.53 \times 10^3$
- D)  $6.53 \times 10^{-4}$

Answer: <https://biology-forums.com/index.php?topic=290570>

### Question 1933

Why does Cu dissolve in concentrated nitric acid but not in concentrated hydrochloric acid?

- A) The chloride ion is a stronger oxidizing agent than the nitrate ion.
- B) The hydrochloric acid is not as strong as nitric acid.
- C) The hydrochloric acid produces insufficient hydronium ion to react with the copper.
- D) The nitrate ion is a stronger oxidizing agent than the hydronium ion.

Answer: <https://biology-forums.com/index.php?topic=291789>

### Question 1934

Which one of the following statements about balanced equations is false? In a balanced reaction

- A) atoms must be balanced on both sides of the reaction arrow.
- B) mass must be conserved.
- C) molecules must be balanced on both sides of the reaction arrow.
- D) net charge must be balanced on both sides of the reaction arrow.

Answer: <https://biology-forums.com/index.php?topic=289069>

### Question 1935

The number of significant digits in 0.01810 g is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=288858>

### Question 1936

Neptunium-239 has a half-life of 2.35 days. How many days must elapse for a sample of  $^{239}\text{Np}$  to decay to 3.00% of its original quantity?

- A) 0.0841 days
- B) 0.967 days
- C) 1.03 days
- D) 11.9 days

Answer: <https://biology-forums.com/index.php?topic=291438>

### Question 1937

What is the empirical and molecular formulas of 1-tert-butyl-2-methylcyclodecane?

Answer: <https://biology-forums.com/index.php?topic=292058>

### Question 1938

Gaseous elements characterized by low reactivity are found in group \_\_\_\_\_ of the periodic table.

- A) 5A
- B) 6A
- C) 7A
- D) 8A

Answer: <https://biology-forums.com/index.php?topic=288875>

### Question 1939

How many lone pairs in the correct electron dot structure of  $\text{O}_3$ ?

- A) 2
- B) 3
- C) 4
- D) 6

Answer: <https://biology-forums.com/index.php?topic=289614>

### Question 1940

Which carbon containing compound is an inorganic compound?

- A)  $C_7H_7NO_2$
- B) HCN
- C)  $CH_3CO_2H$
- D)  $C_6H_5Br$

Answer: <https://biology-forums.com/index.php?topic=291878>

### Question 1941

$NaNO_3(aq)$  is employed in the salt bridge. Give the direction of electron flow and the direction of ion flow from the salt bridge.

- A) Electrons flow from a to c;  $Na^+$  flows into b and  $NO_3^-$  flows into d.
- B) Electrons flow from a to c;  $NO_3^-$  flows into b and  $Na^+$  flows into d.
- C) Electrons flow from c to a;  $Na^+$  flows into b and  $NO_3^-$  flows into d.
- D) Electrons flow from c to a;  $NO_3^-$  flows into b and  $Na^+$  flows into d.

Answer: <https://biology-forums.com/index.php?topic=291180>

### Question 1942

What is the chemical symbol for arsenic?

- A) Ac
- B) Ar
- C) As
- D) At

Answer: <https://biology-forums.com/index.php?topic=288933>

### Question 1943

Calculate the concentration of bicarbonate ion,  $HCO_3^-$ , in a 0.050 M  $H_2CO_3$  solution that has the stepwise dissociation constants  $K_{a1} = 4.3 \times 10^{-7}$  and  $K_{a2} = 5.6 \times 10^{-11}$ .

- A)  $1.5 \times 10^{-4}$  M
- B)  $4.3 \times 10^{-7}$  M
- C)  $2.2 \times 10^{-8}$  M
- D)  $5.6 \times 10^{-11}$  M

Answer: <https://biology-forums.com/index.php?topic=290778>

### Question 1944

What is the molality of a glucose solution prepared by dissolving 27.0 g of glucose,  $C_6H_{12}O_6$ , in 125.9 g of water?

- A)  $1.19 \times 10^{-3}$  m
- B) 0.214 m
- C) 0.981 m
- D) 1.19 m

Answer: <https://biology-forums.com/index.php?topic=290290>

### Question 1945

What is the pH of a solution prepared by diluting 50.00 mL of 0.020 M  $Ba(OH)_2$  with enough water to produce a total volume of 250.00 mL?

- A) 2.10
- B) 2.40
- C) 11.60
- D) 11.90

Answer: <https://biology-forums.com/index.php?topic=290765>

### Question 1946

Which substance has the highest standard molar entropy at 25°C?

- A) C(graphite)
- B)  $C_2H_4(g)$
- C)  $CH_3OCH_3(l)$
- D)  $BaCO_3(s)$

Answer: <https://biology-forums.com/index.php?topic=291039>

### Question 1947

How many unpaired electrons will Co have in the complex  $[\text{CoCl}_4]^{2-}$ ?

- A) 1
- B) 3
- C) 4
- D) 5

Answer: <https://biology-forums.com/index.php?topic=291523>

### Question 1948

What is the pH at the equivalence point of a weak base-strong acid titration if 20.00 mL of NaOCl requires 28.30 mL of 0.50 M HCl?  $K_a = 3.0 \times 10^{-8}$  for HOCl.

- A) 0.30
- B) 3.18
- C) 3.76
- D) 4.03

Answer: <https://biology-forums.com/index.php?topic=290861>

### Question 1949

The nutritionist unit Calorie is equal to \_\_\_\_\_ calories.

Answer: <https://biology-forums.com/index.php?topic=288856>

### Question 1950

Identify the compound that contains a carbon-carbon double bond.

- A) 2-pentyne
- B) 1-pentene
- C) methyl propanoate
- D) methanol

Answer: <https://biology-forums.com/index.php?topic=292000>

### Question 1951

Which statement is most inconsistent with the chemistry of silicon?

- A) In nature, it is generally found combined with oxygen in  $\text{SiO}_2$  and in various silicate minerals.
- B) It crystallizes in a diamond-like structure and does not form the graphite-like allotrope.
- C) It is a hard, gray, semiconducting solid that melts at  $1410^\circ\text{C}$ .
- D) It is obtained by oxidation of silica sand with coke.

Answer: <https://biology-forums.com/index.php?topic=291775>

### Question 1952

If an equal number of moles of the weak acid HF and the strong base KOH are added to water, is the resulting solution acidic, basic, or neutral?

- A) acidic
- B) basic
- C) neutral
- D) There is insufficient information provided to answer this question.

Answer: <https://biology-forums.com/index.php?topic=290787>

### Question 1953

Which of the following statements are true about reaction mechanisms?

- I. A rate law can be written from the molecularity of the slowest elementary step.
- II. The final rate law can include intermediates.
- III. The rate of the reaction is dependent on the fastest step in the mechanism.
- IV. A mechanism can never be proven to be the correct pathway for a reaction.

- A) I, II, III
- B) II, IV
- C) I, III
- D) I, IV

Answer: <https://biology-forums.com/index.php?topic=290408>

### Question 1954

Iodine is an example of

- A) a compound.
- B) an element.

- C) a mixture.
- D) an ion.

Answer: <https://biology-forums.com/index.php?topic=288987>

### Question 1955

Which element is most likely to have an anomalous electron configuration?

- A) Zr
- B) Mn
- C) Au
- D) Ca

Answer: <https://biology-forums.com/index.php?topic=291550>

### Question 1956

An ionic compound crystallizes in a unit cell having a face-centered cubic array of anions,  $X^-$ , and half of the tetrahedral holes filled with metal ions,  $Mn^+$ . The empirical formula of this ionic compound is

- A) MX.
- B)  $MX_2$ .
- C)  $M_2X$ .
- D)  $M_2X_7$ .

Answer: <https://biology-forums.com/index.php?topic=290114>

### Question 1957

Of the following elements, which has the highest electronegativity?

- A) Si
- B) N
- C) Ga
- D) Cd

Answer: <https://biology-forums.com/index.php?topic=289590>

### Question 1958

Which of the following molecules is expected to have the highest melting point?

- A)  $H_2$
- B)  $Cl_2$
- C)  $CCl_4$
- D) NaCl

Answer: <https://biology-forums.com/index.php?topic=289604>

### Question 1959

What is the quantitative change in the cell voltage on increasing the ion concentration in the cathode compartment by a factor of 10?

- A) +0.06 V
- B) +0.03 V
- C) -0.03 V
- D) -0.06 V

Answer: <https://biology-forums.com/index.php?topic=291186>

### Question 1960

Three atoms have the following properties.

Proton Neutron Electron

Atom X 119 119 119

Atom Y 119 118 119

Atom Z 118 118 119

The elements Y and Z are best described as

- A) isotopes.
- B) cations.
- C) different elements.
- D) anions.

Answer: <https://biology-forums.com/index.php?topic=288902>

### Question 1961

Which of the following liquids will exhibit the highest vapor pressure?

- A) Br<sub>2</sub>, bp = 58.8°C
- B) CH<sub>3</sub>OH, bp = 64.7°C
- C) H<sub>2</sub>O, bp = 100°C
- D) All exhibit the same vapor pressure.

Answer: <https://biology-forums.com/index.php?topic=290094>

### Question 1962

What are the common oxidation states of the Group 3A elements Al and Tl?

- A) both are +3
- B) +3 for Al and +1 for Tl
- C) +3 for Al and both +1 and +3 for Tl
- D) +3 for Al and +1, +3, and -5 for Tl

Answer: <https://biology-forums.com/index.php?topic=291736>

### Question 1963

Which has the greatest density?

- A) Sc
- B) V
- C) Cu
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291528>

### Question 1964

At a given temperature and pressure, which of the following would be expected to have the greatest molar entropy?

- A) I<sub>2</sub>(s)
- B) I<sub>2</sub>(l)
- C) I<sub>2</sub>(g)
- D) All of these would be expected to have the same molar entropy.

Answer: <https://biology-forums.com/index.php?topic=289879>

### Question 1965

How many grams of AgNO<sub>3</sub> are needed to make 250. mL of a solution that is 0.140 M?

- A) 0.0951 g
- B) 0.168 g
- C) 5.95 g
- D) 95.1 g

Answer: <https://biology-forums.com/index.php?topic=289279>

### Question 1966

What effect will a change in temperature have on the value of K<sub>p</sub>?

- A) It will have no effect on the value of K<sub>p</sub>.
- B) The value of K<sub>p</sub> always decreases with an increase in temperature.
- C) The value of K<sub>p</sub> always increases with an increase in temperature.
- D) The value of K<sub>p</sub> will decrease or increase with an increase in temperature, depending on whether the reaction is exothermic or endothermic.

Answer: <https://biology-forums.com/index.php?topic=290554>

### Question 1967

Phenobarbital is an antiepileptic drug with a water solubility of  $4.3 \times 10^{-3}$  M and pK<sub>a</sub> = 7.4. What is the pH and percent ionization of  $4.3 \times 10^{-3}$  M phenobarbital?

Answer: <https://biology-forums.com/index.php?topic=290818>

### Question 1968

Which ion has the smallest ionic radius?

- A) F<sup>-</sup>
- B) Cl<sup>-</sup>
- C) Br<sup>-</sup>
- D) I<sup>-</sup>

Answer: <https://biology-forums.com/index.php?topic=289479>

### Question 1969

The decay constant,  $k$ , is given for each of the beta emitters below. Which one has the shortest half life?

- A)  $^{115}\text{In}$ ,  $4.29 \times 10^{-9} \text{ s}^{-1}$
- B)  $^{131}\text{I}$ ,  $9.94 \times 10^{-7} \text{ s}^{-1}$
- C)  $^{217}\text{At}$ ,  $21.4 \text{ s}^{-1}$
- D)  $^{42}\text{K}$ ,  $1.55 \times 10^{-5} \text{ s}^{-1}$

Answer: <https://biology-forums.com/index.php?topic=291440>

### Question 1970

The molecule  $\text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{OH}$  contains an \_\_\_\_\_ functional group and an \_\_\_\_\_ functional group.

Answer: <https://biology-forums.com/index.php?topic=292055>

### Question 1971

What type of shielding can be used to protect against gamma rays?

- A) paper
- B) lead
- C) heavy clothing
- D) No shielding is effective against gamma rays.

Answer: <https://biology-forums.com/index.php?topic=291451>

### Question 1972

How many sodium atoms are in 3.00 g of sodium dichromate,  $\text{Na}_2\text{Cr}_2\text{O}_7$ ?

- A) 0.023 oxygen atoms
- B)  $2.82 \times 10^{20}$  oxygen atoms
- C)  $1.97 \times 10^{21}$  oxygen atoms
- D)  $1.38 \times 10^{22}$  oxygen atoms

Answer: <https://biology-forums.com/index.php?topic=289084>

### Question 1973

24.0 g of which element contains the greatest number of atoms?

- A) Be
- B) C
- C) O
- D) Na

Answer: <https://biology-forums.com/index.php?topic=288984>

### Question 1974

If a sample of  $^{233}\text{Pa}$  takes 62.7 days to decrease to 20.0% of its original mass, what is its half-life?

- A) 0.0370 days
- B) 27.0 days
- C) 157 days
- D) 195 days

Answer: <https://biology-forums.com/index.php?topic=291357>

### Question 1975

Automobile tires are typically inflated to about 30 pounds of pressure per square inch. What is the typical air pressure of a tire in kPa?

- A)  $2.0 \times 10^{-3}$  kPa
- B) 2.0 kPa
- C)  $2.1 \times 10^2$  kPa
- D)  $2.1 \times 10^5$  kPa

Answer: <https://biology-forums.com/index.php?topic=289915>

### Question 1976

Given that  $2.54 \text{ cm} = 1 \text{ in}$ ,  $350 \text{ in}^3 =$  \_\_\_\_\_ L.

Answer: <https://biology-forums.com/index.php?topic=288860>

### Question 1977

Which of the following gases has the highest average speed at 400K?

- A) NO<sub>2</sub>
- B) SO<sub>2</sub>
- C) OF<sub>2</sub>
- D) SF<sub>6</sub>

Answer: <https://biology-forums.com/index.php?topic=290030>

### Question 1978

Sodium hydroxide is available commercially as a 50.0% by weight aqueous solution. Calculate the molality of this sodium hydroxide solution.

- A) 0.450 m
- B) 19.1 m
- C) 25.0 m
- D) 125. m

Answer: <https://biology-forums.com/index.php?topic=290227>

### Question 1979

Which of the following species has the ground-state electron configuration [Ar]3d<sup>4</sup>?

- A) V
- B) Ti<sup>+</sup>
- C) V<sup>+</sup>
- D) Fe<sup>2+</sup>

Answer: <https://biology-forums.com/index.php?topic=291551>

### Question 1980

A solution is prepared by dissolving 17.75 g sulfuric acid, H<sub>2</sub>SO<sub>4</sub>, in enough water to make 100.0 mL of solution. If the density of the solution is 1.1094 g/mL, what is the molarity?

- A) 0.1775 M H<sub>2</sub>SO<sub>4</sub>
- B) 0.1810 M H<sub>2</sub>SO<sub>4</sub>
- C) 1.810 M H<sub>2</sub>SO<sub>4</sub>
- D) 1.940 M H<sub>2</sub>SO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=290208>

### Question 1981

What is the strongest acid among the following?

- A) H<sub>2</sub>SO<sub>3</sub>
- B) H<sub>2</sub>SO<sub>4</sub>
- C) H<sub>2</sub>SeO<sub>2</sub>
- D) H<sub>2</sub>TeO<sub>4</sub>

Answer: <https://biology-forums.com/index.php?topic=290746>

### Question 1982

What is the chemical symbol for niobium?

- A) Au
- B) Nb
- C) Pb
- D) Nn

Answer: <https://biology-forums.com/index.php?topic=288934>

### Question 1983

Na<sub>2</sub>O is named

- A) sodium dioxide.
- B) sodium oxide.
- C) sodium(II) oxide.
- D) sodium oxygen.

Answer: <https://biology-forums.com/index.php?topic=289030>

### Question 1984

Which of the following metals is commonly obtained by electrolysis?

- A) Pt
- B) Ag
- C) Ni



D) Na

Answer: <https://biology-forums.com/index.php?topic=291668>

### Question 1985

Each of three identical 15.0-L gas cylinders contains 7.50 mol of gas at 295 K. Cylinder A contains Ne, cylinder B contains F<sub>2</sub>, and cylinder C contains Cl<sub>2</sub>. According to the kinetic molecular theory, which gas has the highest average speed?

- A) Ne
- B) F<sub>2</sub>
- C) Cl<sub>2</sub>
- D) All have identical average speeds

Answer: <https://biology-forums.com/index.php?topic=290035>

### Question 1986

Which one of the following binary oxides is the most basic?

- A) Na<sub>2</sub>O
- B) PbO<sub>2</sub>
- C) I<sub>2</sub>O<sub>5</sub>
- D) TeO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=291899>

### Question 1987

A solution with a hydroxide ion concentration of  $4.15 \times 10^{-4}$  M is \_\_\_\_\_ and has a hydrogen ion concentration of \_\_\_\_\_.

- A) acidic,  $2.41 \times 10^{-10}$  M
- B) acidic,  $2.41 \times 10^{-11}$  M
- C) basic,  $2.41 \times 10^{-10}$  M
- D) basic,  $2.41 \times 10^{-11}$  M

Answer: <https://biology-forums.com/index.php?topic=290654>

### Question 1988

A solution of LiCl in water is 9.00 wt% LiCl. What is the mole fraction of LiCl?

- A) 0.0407
- B) 0.0466
- C) 0.212
- D) 2.28

Answer: <https://biology-forums.com/index.php?topic=290231>

### Question 1989

The structure of DNA was proposed by

- A) Einstein.
- B) Curie.
- C) Watson and Crick.
- D) Copernicus.

Answer: <https://biology-forums.com/index.php?topic=292042>

### Question 1990

C<sub>2</sub>H<sub>6</sub>O is the empirical formula for both ethyl alcohol, CH<sub>3</sub>CH<sub>2</sub>OH and dimethyl ether, CH<sub>3</sub>OCH<sub>3</sub>. In order to boil CH<sub>3</sub>CH<sub>2</sub>OH the strongest intermolecular forces that must be overcome are (London dispersion, dipole-dipole, hydrogen bonding) forces. In order to boil CH<sub>3</sub>OCH<sub>3</sub> the strongest intermolecular forces that must be overcome are (London dispersion, dipole-dipole, hydrogen bonding) forces. Which compound is expected to have the higher boiling point?

Answer: <https://biology-forums.com/index.php?topic=292054>

### Question 1991

Which of the following elements forms the most ionic binary hydride?

- A) Fr
- B) Ba
- C) Po
- D) At

Answer: <https://biology-forums.com/index.php?topic=291857>

### Question 1992

In organic molecules the molecular geometry exhibited by carbon is \_\_\_\_\_ when carbon is bonded to four atoms by four single bonds, \_\_\_\_\_ when carbon is bonded to three atoms by one double bond and two single bonds, and \_\_\_\_\_ when carbon is bonded to two atoms by one triple bond and one single bond.

Answer: <https://biology-forums.com/index.php?topic=292043>

### Question 1993

None of the listed compounds contains a ring. Which could have one carbon-carbon double bond?

- A) C<sub>9</sub>H<sub>20</sub>
- B) C<sub>2</sub>H<sub>2</sub>
- C) C<sub>3</sub>H<sub>6</sub>
- D) All of these

Answer: <https://biology-forums.com/index.php?topic=292005>

### Question 1994

Which of the following statements does not describe a physical property of chlorine?

- A) Chlorine combines with sodium to form table salt.
- B) The color of chlorine gas is green.
- C) The density of chlorine gas at standard temperature and pressure is 3.17 g/L.
- D) The freezing point of chlorine is -101°C.

Answer: <https://biology-forums.com/index.php?topic=288871>

### Question 1995

Which of the following buffer solutions will exhibit the highest pH?

- A) 0.100 M NH<sub>3</sub> with 0.100 M NH<sub>4</sub><sup>+</sup>
- B) 0.200 M NH<sub>3</sub> with 0.100 M NH<sub>4</sub><sup>+</sup>
- C) 0.200 M NH<sub>3</sub> with 0.0400M NH<sub>4</sub><sup>+</sup>
- D) 0.800 M NH<sub>3</sub> with 0.800 M NH<sub>4</sub><sup>+</sup>

Answer: <https://biology-forums.com/index.php?topic=290850>

### Question 1996

Which of the following elements is not a solid at room temperature?

- A) Zn
- B) Hg
- C) N
- D) C

Answer: <https://biology-forums.com/index.php?topic=288960>

### Question 1997

At 298 K which is larger rate of effusion or rate of diffusion?

Answer: <https://biology-forums.com/index.php?topic=290066>

### Question 1998

An element in a ground state electron configuration has 4 electrons in the 4p orbitals. Which of the following statements can not describe the electron configurations in this atom?

- A) At least one electron has an orbital angular momentum (l) of 2.
- B) Six electrons are in the n=4 shell.
- C) The valence electron configuration is identical to carbon.
- D) No electrons have an orbital angular momentum (l) of 3.

Answer: <https://biology-forums.com/index.php?topic=289402>

### Question 1999

When a substance decays by beta emission, the mass number of the nucleus \_\_\_\_\_ and the atomic number \_\_\_\_\_.

- A) decreases by 2, remains the same
- B) increases by 2, remains the same
- C) remains the same, decreases by 1
- D) remains the same, increases by 1

Answer: <https://biology-forums.com/index.php?topic=291426>

### Question 2000

Which will alter the composition of an equilibrium mixture?

- A) increase the volume
- B) increase the temperature
- C) increase the pressure
- D) all of the above

Answer: <https://biology-forums.com/index.php?topic=290599>

### Question 2001

By analogy with the oxoacids of sulfur,  $\text{H}_2\text{TeO}_3$  would be named

- A) hydrotellurous acid.
- B) pertelluric acid.
- C) telluric acid.
- D) tellurous acid.

Answer: <https://biology-forums.com/index.php?topic=289241>

### Question 2002

How many mL of a 0.175 M  $\text{FeCl}_3$  solution are needed to make 550. mL of a solution that is 0.300 M in  $\text{Cl}^-$  ion?

- A) 0.943 mL
- B) 314 mL
- C) 943 mL
- D) It is not possible to make a more concentrated solution from a less concentrated solution.

Answer: <https://biology-forums.com/index.php?topic=289290>

### Question 2003

What is the pH at the equivalence point of a weak acid-strong base titration?

- A)  $\text{pH} < 7$
- B)  $\text{pH} = 7$
- C)  $\text{pH} > 7$
- D)  $\text{pH} = 14.00$

Answer: <https://biology-forums.com/index.php?topic=290854>

### Question 2004

What is not generally considered to be a ceramic?

- A) silicon, Si
- B) zirconia,  $\text{ZrO}_2$
- C) silicon carbide, SiC
- D) silicon nitride,  $\text{Si}_3\text{N}_4$

Answer: <https://biology-forums.com/index.php?topic=291681>

### Question 2005

The diameter of an atom is approximately  $1 \times 10^{-10}$  m. What is the diameter in centimeters?

- A)  $1 \times 10^{-13}$  cm
- B)  $1 \times 10^{-12}$  cm
- C)  $1 \times 10^{-8}$  cm
- D)  $1 \times 10^{-7}$  cm

Answer: <https://biology-forums.com/index.php?topic=288801>

### Question 2006

The equilibrium constant,  $K_p$ , equals 3.40 for the isomerization reaction:

$\text{cis-2-butene} \rightleftharpoons \text{trans-2-butene}$ .

If a flask initially contains 0.250 atm of cis-2-butene and 0.205 atm of trans-2-butene, what is the equilibrium pressure of each gas?

- A)  $P(\text{cis-2-butene}) = 0.0603$  atm and  $P(\text{trans-2-butene}) = 0.205$  atm
- B)  $P(\text{cis-2-butene}) = 0.0431$  atm and  $P(\text{trans-2-butene}) = 0.147$  atm
- C)  $P(\text{cis-2-butene}) = 0.0735$  atm and  $P(\text{trans-2-butene}) = 0.250$  atm
- D)  $P(\text{cis-2-butene}) = 0.103$  atm and  $P(\text{trans-2-butene}) = 0.352$  atm

Answer: <https://biology-forums.com/index.php?topic=290582>

### Question 2007

In which set are all compounds considered to be covalent binary hydrides?

- A) CsH, KH, CaH<sub>2</sub>, BaH<sub>2</sub>
- B) CaH<sub>2</sub>, SrH<sub>2</sub>, AlH<sub>3</sub>, SiH<sub>4</sub>
- C) BeH<sub>2</sub>, B<sub>2</sub>H<sub>6</sub>, GeH<sub>4</sub>, PH<sub>3</sub>
- D) CaH<sub>2</sub>, AlH<sub>3</sub>, SiH<sub>4</sub>, H<sub>2</sub>S

Answer: <https://biology-forums.com/index.php?topic=291862>

### Question 2008

Which compound is a saturated hydrocarbon?

- A) benzene
- B) cyclohexene
- C) 2-methylpentane
- D) propylene

Answer: <https://biology-forums.com/index.php?topic=292001>

### Question 2009

Which of the following represent electron configurations that are allowed but do not represent ground-state configurations?

- (A) [Ne]3s<sup>1</sup>3p<sup>5</sup> (B) [Kr]4d<sup>1</sup>2s<sup>2</sup>5p<sup>5</sup> (C) [Ar]3d<sup>10</sup>4s<sup>2</sup>4p<sup>2</sup>
- A) only (A)
- B) only (B)
- C) (A) and (B)
- D) (B) and (C)

Answer: <https://biology-forums.com/index.php?topic=289431>

### Question 2010

What is the average speed (actually the root-mean-square speed) of a xenon atom at 27°C?

- A) 2.27 m/s
- B) 7.57 m/s
- C) 71.7 m/s
- D) 239 m/s

Answer: <https://biology-forums.com/index.php?topic=290029>

### Question 2011

Which allotrope of carbon has the atoms arranged in a spherical array?

- A) coke
- B) diamond
- C) fullerene
- D) graphite

Answer: <https://biology-forums.com/index.php?topic=291763>

### Question 2012

What is the mole fraction of I<sub>2</sub> in a solution made by dissolving 139 g of I<sub>2</sub> in 245 g of hexane, C<sub>6</sub>H<sub>14</sub>?

- A) 0.161
- B) 0.193
- C) 0.278
- D) 0.385

Answer: <https://biology-forums.com/index.php?topic=290278>

### Question 2013

KI crystallizes in a cubic unit cell with I<sup>-</sup> ions on each corner and each face. How many K<sup>+</sup> and I<sup>-</sup> ions are in each unit cell of KI?

- A) 1 K<sup>+</sup> ion and 1 I<sup>-</sup> ion
- B) 2 K<sup>+</sup> ions and 2 I<sup>-</sup> ions
- C) 4 K<sup>+</sup> ions and 4 I<sup>-</sup> ions
- D) 8 K<sup>+</sup> ions and 8 I<sup>-</sup> ions

Answer: <https://biology-forums.com/index.php?topic=290161>

### Question 2014

Which of the following phase changes has a positive value for its entropy change?

- A) creating steam
- B) formation of snow from a cloud
- C) sublimation of gaseous CO<sub>2</sub>
- D) making ice cubes from liquid water

Answer: <https://biology-forums.com/index.php?topic=290138>

### Question 2015

How many moles are in 7.8 g of acetamide, CH<sub>3</sub>CONH<sub>2</sub>?

Answer: <https://biology-forums.com/index.php?topic=289190>

### Question 2016

A binary ionic compound, MxA<sub>y</sub>, crystallizes in a cubic structure that contains eight anions (A) entirely within its unit cell and a cation (M) on each corner and on each face. What is the empirical formula of this compound?

- A) MA
- B) MA<sub>2</sub>
- C) M<sub>2</sub>A
- D) M<sub>4</sub>A<sub>8</sub>

Answer: <https://biology-forums.com/index.php?topic=290119>

### Question 2017

What is the name of the compound formed between Ca and N?

- A) calcium dinitride
- B) calcium trinitride
- C) monocalcium trinitride
- D) calcium nitride

Answer: <https://biology-forums.com/index.php?topic=288928>

### Question 2018

Which has the greatest density?

- A) La
- B) W
- C) Os
- D) Hg

Answer: <https://biology-forums.com/index.php?topic=291540>

### Question 2019

Choose the words that best explain why some metals such as Pt and Au are found naturally as pure elements. Metals with a \_\_\_\_\_ reduction potential are more likely to form compounds and less likely to be found as a pure element.

- A) highly positive
- B) slightly positive
- C) highly negative
- D) slightly negative

Answer: <https://biology-forums.com/index.php?topic=291612>

### Question 2020

Round off 477,503 to four significant figures.

- A) 4775
- B) 4776
- C)  $4.775 \times 10^5$
- D)  $4.776 \times 10^5$

Answer: <https://biology-forums.com/index.php?topic=288835>

### Question 2021

Calculate the pH of a 0.100 M CH<sub>3</sub>NH<sub>3</sub>Cl solution. K<sub>b</sub> for methylamine, CH<sub>3</sub>NH<sub>2</sub>, is  $3.7 \times 10^{-4}$ .

- A) 2.22
- B) 5.78
- C) 8.22
- D) 11.78

Answer: <https://biology-forums.com/index.php?topic=290718>

### Question 2022

At some temperature, a 4.0 L flask is found to contain 10.0 mol of  $\text{CO}_2$ , 8.0 mol of C, and 10.0 mol of CO, at equilibrium. What is the value of the equilibrium constant,  $K_c$ , for this reaction?

- A) 1.25
- B) 0.50
- C) 0.40
- D) 2.50

Answer: <https://biology-forums.com/index.php?topic=290574>

### Question 2023

In which of the following sets do all species have the same number of electrons?

- A) I, Xe,  $\text{Cs}^{2+}$
- B) C,  $\text{N}^{3-}$ ,  $\text{O}^{2-}$
- C)  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Ba}^{2+}$
- D) S,  $\text{S}^{2-}$ ,  $\text{S}^{2+}$

Answer: <https://biology-forums.com/index.php?topic=288998>

### Question 2024

The mass number of an atom is equal to the number of

- A) electrons.
- B) neutrons.
- C) protons.
- D) protons plus neutrons.

Answer: <https://biology-forums.com/index.php?topic=288890>

### Question 2025

The dipole moment of BrF is 1.29 D, and its bond length is 178 pm. What is the percent ionic character of the Br—F bond?

- A) 3.9%
- B) 8.5%
- C) 15%
- D) 33%

Answer: <https://biology-forums.com/index.php?topic=289683>

### Question 2026

In which of the following solutions would solid AgCl be expected to be the least soluble at 25°C?

- A) 0.1 M HCl
- B) 0.1 M KCl
- C) 0.1 M  $\text{BaCl}_2$
- D) 0.1 M KNO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290926>

### Question 2027

Which of the following is not true?

- A) All moving objects have wave characteristics.
- B) For objects moving at a given speed, the larger the mass, the shorter the wavelength.
- C) The de Broglie relation and the Heisenberg uncertainty principle apply only to small particles.
- D) The Heisenberg uncertainty principle is an inequality.

Answer: <https://biology-forums.com/index.php?topic=289378>

### Question 2028

"If a stress is applied to a reaction mixture at equilibrium, the reaction occurs in the direction that will relieve the stress." This statement is called

- A) the Third Law of Thermodynamics.
- B) the Law of Combining Volumes.
- C) the Law of Mass Action.
- D) Le Châtelier's principle.

Answer: <https://biology-forums.com/index.php?topic=290588>

### Question 2029

The ozone molecules in the stratosphere absorb much of the ultraviolet radiation from the sun, protecting life on Earth. At a certain altitude, the temperature of the stratosphere is 240 K and the partial pressure of ozone is  $1.4 \times 10^{-7}$  atm. Calculate the number of ozone molecules present in 1.00 L of atmosphere at that altitude.

- A)  $2.1 \times 10^{15}$  molecules of O<sub>3</sub>
- B)  $4.3 \times 10^{15}$  molecules of O<sub>3</sub>
- C)  $8.0 \times 10^{31}$  molecules of O<sub>3</sub>
- D)  $1.8 \times 10^{32}$  molecules of O<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=289962>

### Question 2030

The tripositive ion with the electron configuration [Ar]3d<sup>6</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289566>

### Question 2031

Which of the halogens forms more than one perhalic acid?

- A) F
- B) Cl
- C) Br
- D) I

Answer: <https://biology-forums.com/index.php?topic=291831>

### Question 2032

The third-row element having a less negative electron affinity than the elements on either side of it on the periodic table is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289578>

### Question 2033

One of the group 3A elements is extremely toxic due to the similarities in chemistry of one of its ions to alkali metal chemistry. Which element is it?

- A) B
- B) Ga
- C) In
- D) Tl

Answer: <https://biology-forums.com/index.php?topic=291739>

### Question 2034

A gas bottle contains 0.450 mol of gas at 730 mm Hg pressure. If the final pressure is 1.15 atm, how many moles of gas were added to the bottle?

- A) 0.0471 mol
- B) 0.0888 mol
- C) 0.497 mol
- D) 0.539 mol

Answer: <https://biology-forums.com/index.php?topic=289994>

### Question 2035

Which M<sup>3+</sup> ion of group 3A elements is the easiest to reduce?

- A) B
- B) Al
- C) Ga
- D) In

Answer: <https://biology-forums.com/index.php?topic=291741>

### Question 2036

What fraction of collisions will have sufficient energy to react for a gas whose activation energy is 68 kJ/mol at 25°C?

- A)  $1.2 \times 10^{-12}$
- B)  $2.7 \times 10^{-2}$
- C) 27
- D)  $8.3 \times 10^{11}$

Answer: <https://biology-forums.com/index.php?topic=290445>

### Question 2037

For an electron in a given atom, the larger n, the

- A) larger the average distance from the nucleus and the higher the orbital energy.
- B) larger the average distance from the nucleus and the lower the orbital energy.
- C) smaller the average distance from the nucleus and the higher the orbital energy.
- D) smaller the average distance from the nucleus and the lower the orbital energy.

Answer: <https://biology-forums.com/index.php?topic=289383>

### Question 2038

Given three cylinders containing O<sub>2</sub> gas at the same volume and pressure. Cylinder A is at -25°C, cylinder B is at -20°F, and cylinder C is at 250 K. Which cylinder contains the largest mass of oxygen?

- A) cylinder A
- B) cylinder B
- C) cylinder C
- D) All cylinders contain the same mass of O<sub>2</sub>.

Answer: <https://biology-forums.com/index.php?topic=290009>

### Question 2039

The electronegativity for both sulfur and carbon is 2.5. Therefore the compound CS<sub>2</sub> would be expected to

- A) be ionic with C as the anion.
- B) be ionic with C as the cation.
- C) have nonpolar covalent bonds between C and S.
- D) have polar covalent bonds between C and S.

Answer: <https://biology-forums.com/index.php?topic=289596>

### Question 2040

How would one classify copper mixed with tin?

- A) conductor
- B) n-type semiconductor
- C) p-type semiconductor
- D) insulator

Answer: <https://biology-forums.com/index.php?topic=291630>

### Question 2041

According to kinetic molecular theory, which of the following will decrease the rate of reaction?

- A) increase the temperature
- B) increase the concentration
- C) increase the size of the molecule
- D) increase the size of the reaction vessel

Answer: <https://biology-forums.com/index.php?topic=290396>

### Question 2042

What is the most stable oxidation state for Bi in bismuth compounds?

- A) -2
- B) +1
- C) +3
- D) +2

Answer: <https://biology-forums.com/index.php?topic=291884>

### Question 2043

Which of the following pairs of solutions have roughly the same boiling point elevation?

- A) 0.100 m C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> and 0.0333 m CuF<sub>2</sub>
- B) 0.100 m KF and 0.100 m C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
- C) 0.200 m KCl and 0.300 m Li<sub>2</sub>SO<sub>4</sub>
- D) 0.100 m LiBr and 0.0500 m MgBr<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290321>

### Question 2044

A steel bottle contains argon gas at STP. What is the final pressure if the temperature is changed to 85°C?

- A) 0.666 atm
- B) 0.762 atm
- C) 0.850 atm



D) 1.31 atm

Answer: <https://biology-forums.com/index.php?topic=289939>

### Question 2045

Elements in a periodic group have similar

- A) chemical properties.
- B) densities.
- C) masses.
- D) physical properties.

Answer: <https://biology-forums.com/index.php?topic=288869>

### Question 2046

Which of the following is the correct chemical formula for a molecule of iodine?

- A) I
- B) I-
- C) I+
- D) I<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289005>

### Question 2047

Which of the following compounds is not an Arrhenius acid?

- A) HF
- B) KOH
- C) HClO
- D) H<sub>2</sub>SO<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=289225>

### Question 2048

Selenous acid, H<sub>2</sub>SeO<sub>3</sub> has acid dissociation constants  $K_{a1} = 3.5 \times 10^{-2}$  and  $K_{a2} = 5 \times 10^{-8}$ . When 25.00 mL of 0.100 M selenous acid is titrated with 0.200 M NaOH the first equivalence point occurs at pH = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290948>

### Question 2049

The decomposition of nitrosyl bromide is exothermic:  $2 \text{NOBr(g)} \rightleftharpoons 2 \text{NO(g)} + \text{Br}_2\text{(g)}$ . Which of the following changes in reaction condition will shift the reaction to the left?

- A) remove NO
- B) decrease the temperature
- C) decrease the pressure
- D) None of these

Answer: <https://biology-forums.com/index.php?topic=290598>

### Question 2050

Oxalic acid, H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> has acid dissociation constants  $K_{a1} = 5.9 \times 10^{-2}$  and  $K_{a2} = 6.4 \times 10^{-5}$ . What is the pH after 20.00 mL of 0.0500 M NaOH is added to 5.00 mL of 0.2000 M H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>?

- A) 1.23
- B) 2.10
- C) 2.80
- D) 4.19

Answer: <https://biology-forums.com/index.php?topic=290865>

### Question 2051

What is the pH of a buffered system made by dissolving 17.42 g of KH<sub>2</sub>PO<sub>4</sub> and 20.41 g of K<sub>2</sub>HPO<sub>4</sub> in water to give a volume of 200.0 mL? The  $K_{a2}$  for dihydrogen phosphate is  $6.2 \times 10^{-8}$  and the equilibrium reaction of interest is  $\text{H}_2\text{PO}_4\text{(aq)} + \text{H}_2\text{O(l)} \rightleftharpoons \text{H}_3\text{O}^+\text{(aq)} + \text{HPO}_4\text{(aq)}$ .

- A) 7.03
- B) 7.17
- C) 7.38
- D) 7.58

Answer: <https://biology-forums.com/index.php?topic=290833>

### Question 2052

A solution is prepared by dissolving 171 g of  $\text{CdCl}_2$  in enough water to make 250.0 mL of solution. If the density of the solution is 1.556 g/mL, what is the molarity of the solution?

- A) 0.440 M
- B) 0.684 M
- C) 0.933 M
- D) 3.73 M

Answer: <https://biology-forums.com/index.php?topic=290211>

### Question 2053

Which of the species below has 28 protons and 26 electrons?

- A)  $\text{Fe}^{2+}$
- B)  $\text{Ni}^{2+}$
- C) Fe
- D) Ni

Answer: <https://biology-forums.com/index.php?topic=288916>

### Question 2054

"Wood alcohol" is the common name for

- A) methanol.
- B) ethanol.
- C) 2-propanol.
- D) 1, 2-ethanediol.

Answer: <https://biology-forums.com/index.php?topic=291948>

### Question 2055

By what factor does the entropy increase for a collection of 100 molecules from a system of  $1 \times 10^5$  boxes to  $1 \times 10^6$  boxes?

Answer: <https://biology-forums.com/index.php?topic=291056>

### Question 2056

The region of the atmosphere that is closest to the earth's surface is the \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290069>

### Question 2057

Which of the following compounds is an Arrhenius base?

- A)  $\text{CH}_3\text{OH}$
- B)  $\text{CH}_3\text{CO}_2\text{H}$
- C)  $\text{HOCl}$
- D)  $\text{LiOH}$

Answer: <https://biology-forums.com/index.php?topic=289305>

### Question 2058

A car drives 80 km/h. If the car is driven for 122 minutes, how many miles has the car traveled?

- A) 262
- B) 364,000
- C) 101
- D) 24.4

Answer: <https://biology-forums.com/index.php?topic=288840>

### Question 2059

What oxidation state(s) is(are) exhibited by all first row transition elements except scandium?

- A) +2
- B) +3
- C) +2 and +3
- D) +2, +3 and +4

Answer: <https://biology-forums.com/index.php?topic=291489>

### Question 2060

A curie is

- A) the amount of sample that undergoes 1 disintegration per second.
- B) the amount of sample that undergoes  $3.7 \times 10^{10}$  disintegrations per second.
- C) the amount of tissue damage done by radiation.
- D) equal to 0.01 J of energy absorbed per kilogram of tissue.

Answer: <https://biology-forums.com/index.php?topic=291398>

### Question 2061

Which has the most positive standard oxidation potential?

- A) Sc
- B) V
- C) Cu
- D) Zn

Answer: <https://biology-forums.com/index.php?topic=291529>

### Question 2062

The orbital hybridization on the carbon atom in S CN - is

- A) sp.
- B) sp<sup>2</sup>.
- C) sp<sup>3</sup>.
- D) sp<sup>3</sup>d<sup>2</sup>.

Answer: <https://biology-forums.com/index.php?topic=289735>

### Question 2063

Which element has the smallest energy band gap?

- A) I
- B) Se
- C) Sn
- D) Te

Answer: <https://biology-forums.com/index.php?topic=291675>

### Question 2064

Which one of the following combinations of neutrons/protons results in the lowest number of nonradioactive (stable) isotopes?

- A) even number protons/even number neutrons
- B) even number protons/odd number neutrons
- C) odd number protons/even number neutrons
- D) odd number protons/odd number neutrons

Answer: <https://biology-forums.com/index.php?topic=291347>

### Question 2065

Which one of the following binary oxides is the most acidic?

- A) K<sub>2</sub>O
- B) Ga<sub>2</sub>O<sub>3</sub>
- C) BeO
- D) Cl<sub>2</sub>O<sub>7</sub>

Answer: <https://biology-forums.com/index.php?topic=291897>

### Question 2066

What type of substances exhibit an increase in conductivity with an increase in temperature?

- A) both metals and semiconductors
- B) only insulators
- C) only metals
- D) only semiconductors

Answer: <https://biology-forums.com/index.php?topic=291622>

### Question 2067

The burning of sulfur-containing coal can lead the formation of \_\_\_\_\_ which is emitted into the atmosphere.

Answer: <https://biology-forums.com/index.php?topic=290070>

### Question 2068

What type of hybrid orbitals are used by the Ti atom to form chemical bonds in the complex ion  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ ?

- A)  $\text{sp}^3$
- B)  $\text{dsp}^2$
- C)  $\text{dsp}^3$
- D)  $\text{d}^2\text{sp}^3$

Answer: <https://biology-forums.com/index.php?topic=291515>

### Question 2069

Helium can be liquefied when He atoms are attracted to one another by intermolecular \_\_\_\_\_ forces.

Answer: <https://biology-forums.com/index.php?topic=289771>

### Question 2070

The density of copper is  $8.96 \text{ g/cm}^3$ . What is the mass in mg of a cube of copper that measures 2.31 mm on each side?

- A) 0.0207 g
- B) 0.110 g
- C) 2.07 g
- D) 110 g

Answer: <https://biology-forums.com/index.php?topic=288758>

### Question 2071

Which of the following elements is most likely to naturally occur as a carbonate?

- A) Ba
- B) Cu
- C) Au
- D) Pd

Answer: <https://biology-forums.com/index.php?topic=291666>

### Question 2072

Sodium metal and water react to form hydrogen and sodium hydroxide. If 11.96 g of sodium react with water to form 0.52 g of hydrogen and 20.80 g of sodium hydroxide, what mass of water was involved in the reaction?

- A) 9.36 g
- B) 11.96 g
- C) 20.28 g
- D) 21.32 g

Answer: <https://biology-forums.com/index.php?topic=288966>

### Question 2073

Which of the following is not an application of colligative properties?

- A) adding silver to mercury to lower the vapor pressure of mercury
- B) desalinating sea water by reverse osmosis
- C) melting snow by application of salt
- D) reduced boiling points of pure liquids at increased altitudes

Answer: <https://biology-forums.com/index.php?topic=290239>

### Question 2074

Which one of the following is a metallic conductor at room temperature but a superconductor at 18 K?

- A) diamond
- B) graphite
- C) fullerene
- D) potassium fulleride

Answer: <https://biology-forums.com/index.php?topic=291637>

### Question 2075

In general, at room temperature

- A) ionic compounds are all solids and covalent compounds are all gases.
- B) ionic compounds are all solids, but covalent compounds may be solids, liquids, or gases.
- C) ionic compounds are all solids, and covalent compounds are liquids or gases.

D) covalent compounds are all gases, but ionic compounds may be solids, liquids, or gases.

Answer: <https://biology-forums.com/index.php?topic=289602>

### Question 2076

What phases can be present at 200°C and 0.75 atm pressure?

- A) only the vapor phase
- B) only the liquid phase
- C) only the solid phase
- D) both the solid and vapor phases

Answer: <https://biology-forums.com/index.php?topic=290130>

### Question 2077

How many protons (p) and neutrons (n) are in an atom of calcium-46?

- A) 20 p, 26 n
- B) 20 p, 46 n
- C) 26 p, 20 n
- D) 46 p, 60 n

Answer: <https://biology-forums.com/index.php?topic=288895>

### Question 2078

Mica cleaves into thin sheets because at the molecular level its structure is

- A) one dimensional.
- B) two dimensional.
- C) three dimensional.
- D) None of these.

Answer: <https://biology-forums.com/index.php?topic=291778>

### Question 2079

The charge, n, on the cyclic anion  $\text{Si}_6\text{O}_{18}^{n-}$  that is found in the mineral beryl is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291915>

### Question 2080

When iron(III) oxide reacts with hydrochloric acid, iron(III) chloride and water are formed. How many grams of iron(III) chloride are formed from 10.0 g of iron(III) oxide and 10.0 g of hydrochloric acid?

- A) 11.1 g
- B) 14.8 g
- C) 20.3 g
- D) 35.1 g

Answer: <https://biology-forums.com/index.php?topic=289107>

### Question 2081

The cubic unit cell in which the radius of an atom is  $\frac{1}{2}d$ , where d is the unit cell edge length, is the \_\_\_\_\_ unit cell.

Answer: <https://biology-forums.com/index.php?topic=290180>

### Question 2082

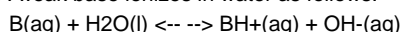
An Arrhenius acid is best defined as a

- A) electron pair donor.
- B) proton acceptor.
- C) substance that dissociates in water to produce aqueous hydrogen ions.
- D) substance that dissociates in water to produce aqueous hydroxide ions.

Answer: <https://biology-forums.com/index.php?topic=290731>

### Question 2083

A weak base ionizes in water as follows:



A 0.150 M solution of B is 2.500 % ionized at 25°C. What is the pH of this solution?

- A) 0.40
- B) 2.43
- C) 11.57

D) 13.60

Answer: <https://biology-forums.com/index.php?topic=290775>

### Question 2084

Which element has the chemical symbol, Au?

- A) antimony
- B) americium
- C) gold
- D) lead

Answer: <https://biology-forums.com/index.php?topic=288936>

### Question 2085

Which of the following molecules will readily form hydrogen bonds with H<sub>2</sub>O?

- A) H<sub>2</sub>
- B) C<sub>3</sub>H<sub>8</sub>
- C) CH<sub>4</sub>
- D) CH<sub>3</sub>OH

Answer: <https://biology-forums.com/index.php?topic=289688>

### Question 2086

Which element has the chemical symbol, Pb?

- A) tin
- B) lead
- C) mercury
- D) potassium

Answer: <https://biology-forums.com/index.php?topic=288938>

### Question 2087

The average mass of an oxygen atom is  $5.3 \times 10^{-26}$  kg. Calculate the kinetic energy of a mole of oxygen atoms, all moving at a speed of 400 m/s (1000 mph).

- A)  $8.2 \times 10^{-21}$  J
- B) 2600 J
- C) 5200 J
- D) 13,000 J

Answer: <https://biology-forums.com/index.php?topic=288766>

### Question 2088

Which of the following straight chain molecules has the greatest standard molar entropy at 25°C?

- A) C<sub>2</sub>H<sub>2</sub>
- B) C<sub>2</sub>H<sub>4</sub>
- C) C<sub>2</sub>H<sub>6</sub>
- D) All have the same entropy.

Answer: <https://biology-forums.com/index.php?topic=291038>

### Question 2089

How many H<sup>+</sup> ions can the acid H<sub>3</sub>PO<sub>4</sub> donate per molecule?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289235>

### Question 2090

Which statement is inconsistent with the chemistry of the noble gases?

- A) Both helium and radon are radioactive.
- B) Helium and neon are both lighter than air.
- C) Neon and argon are used in decorative or designer lights.
- D) Xenon and krypton react with fluorine to form fluorides.

Answer: <https://biology-forums.com/index.php?topic=291839>

### Question 2091

What are the major solute-solvent interactions created when LiF dissolves in water?

- A) dipole-ion
- B) dispersion
- C) hydrogen bonding
- D) ion-dipole

Answer: <https://biology-forums.com/index.php?topic=290275>

### Question 2092

How many electrons are in the ion, P<sup>3-</sup>?

- A) 12
- B) 18
- C) 28
- D) 34

Answer: <https://biology-forums.com/index.php?topic=288912>

### Question 2093

What is the molar solubility of Mg(OH)<sub>2</sub> in a basic solution with a pH of 12.00? K<sub>sp</sub> for Mg(OH)<sub>2</sub> is  $5.6 \times 10^{-12}$ .

- A)  $5.6 \times 10^{-10}$  M
- B)  $5.6 \times 10^{-8}$  M
- C)  $2.4 \times 10^{-6}$  M
- D)  $1.1 \times 10^{-4}$  M

Answer: <https://biology-forums.com/index.php?topic=290920>

### Question 2094

Dinitrogen monoxide is still used as a general anesthetic. The Henry's law constant for the solubility of N<sub>2</sub>O in water is  $2.5 \times 10^{-2}$  mol/L•atm. What is the molar solubility of N<sub>2</sub>O in water if the partial pressure of N<sub>2</sub>O is 1700 mm Hg?

Answer: <https://biology-forums.com/index.php?topic=290334>

### Question 2095

What is the name of the oxide ceramic BeO?

- A) beryllia
- B) beryllic
- C) beryllium ceramic
- D) beryllium oxide

Answer: <https://biology-forums.com/index.php?topic=291649>

### Question 2096

Which ionic compound would be expected to have the highest lattice energy?

- A) Li<sub>2</sub>Se
- B) MgS
- C) Al<sub>2</sub>O<sub>3</sub>
- D) CO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289559>

### Question 2097

Which of the following compounds forms an ionic solid?

- A) water
- B) carbon dioxide
- C) potassium bromide
- D) zinc

Answer: <https://biology-forums.com/index.php?topic=290154>

### Question 2098

Chloroform has a boiling point of 61.1°C and dichloromethane has a boiling point of 40.0°C. When 0.250 mol of dichloromethane is added to 0.750 mol of chloroform, the resulting solution will have a boiling point

- A) between 40.0°C and 61.1°C, but closer to 61.1°C.
- B) between 40.0°C and 61.1°C, but closer to 40.0°C.

C) greater than 61.1°C.

D) less than 40.0°C.

Answer: <https://biology-forums.com/index.php?topic=290320>

### Question 2099

Identify the alkene that cannot be drawn cis and trans.

A) 2-pentene

B) 3-hexene

C) 4-octene

D) 1-hexene

Answer: <https://biology-forums.com/index.php?topic=292017>

### Question 2100

Group 2A metals tend to be somewhat less reactive than alkali metals, and the order of their reactivity is

A) Ba > Sr > Ca > Mg > Be.

B) Be > Mg > Ca > Sr > Ba.

C) Ca > Mg > Be > Ba > Sr.

D) Sr > Ca > Mg > Be > Ba.

Answer: <https://biology-forums.com/index.php?topic=291733>

### Question 2101

A person is most likely to experience serious tissue damage when exposed to which of the following forms of electromagnetic radiation?

A) microwaves

B) ultraviolet

C) radio waves

D) x-rays

Answer: <https://biology-forums.com/index.php?topic=289413>

### Question 2102

Which of the following statements regarding nuclear stability is true?

A) A stable element always has an equal number of protons and neutrons.

B) The most abundant isotope of an element always has an equal number of protons and neutrons.

C) Very few elements have at least one radioactive isotope.

D) Hydrogen is the only element whose most abundant isotope contains more protons than neutrons.

Answer: <https://biology-forums.com/index.php?topic=291353>

### Question 2103

At 300°C decomposition of NO<sub>2</sub>(g) occurs with a rate law: Rate = -k[NO<sub>2</sub>]<sup>x</sup>. If the initial rate of decomposition is 3.2 × 10<sup>-5</sup> M/s when [NO<sub>2</sub>]<sub>0</sub> = 8.0 × 10<sup>-3</sup> M and the initial rate of decomposition is 8.0 × 10<sup>-6</sup> M/s when [NO<sub>2</sub>]<sub>0</sub> = 4.0 × 10<sup>-3</sup> M, then the order of reaction with respect to NO<sub>2</sub>, x = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290470>

### Question 2104

Vanadium ore contains two isotopes of vanadium, 50V and 51V. The least abundant isotope is radioactive and undergoes beta capture. What is the product of the beta decay?

A) 50Cr

B) 51Cr

C) 50Ti

D) 51Ti

Answer: <https://biology-forums.com/index.php?topic=291600>

### Question 2105

The value of K<sub>a</sub> for a 0.250 M HCN solution having a pH of 4.956 is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290814>

### Question 2106

Addition of a small amount of Ga impurity in silicon results in a(n) \_\_\_\_\_-type semiconductor that has a conductivity that is \_\_\_\_\_ (greater, less) than silicon.

Answer: <https://biology-forums.com/index.php?topic=291695>



### Question 2107

The Haber process is the synthesis of ammonia gas from hydrogen and nitrogen on a hot metal surface. What is the catalyst and what type of catalysis is occurring?

- A) H<sub>2</sub>, heterogeneous
- B) N<sub>2</sub>, heterogeneous
- C) NH<sub>3</sub>, heterogeneous
- D) metal surface, heterogeneous

Answer: <https://biology-forums.com/index.php?topic=290458>

### Question 2108

What is a primary ingredient used in the production of iron by the blast furnace process?

- A) bromide
- B) sulfate
- C) sulfide
- D) limestone

Answer: <https://biology-forums.com/index.php?topic=291672>

### Question 2109

What is not a true statement?

- A) BeO is amphoteric but the oxides of the other group 2A elements are basic.
- B) B differs from other elements of group 3A by forming mainly covalent molecular compounds.
- C) BF<sub>3</sub> is a gaseous molecular halide but AlF<sub>3</sub> is a high melting ionic solid.
- D) Compounds with C=C double bonds and Si=Si double bonds are quite common.

Answer: <https://biology-forums.com/index.php?topic=291719>

### Question 2110

A reaction has a rate constant,  $k = 1.2 \times 10^{-12} \text{ s}^{-1}$  at 273 K and  $k = 5.1 \times 10^{-7} \text{ s}^{-1}$  at 373 K has an activation energy,  $E_a =$  \_\_\_\_\_ kJ/mol.

Answer: <https://biology-forums.com/index.php?topic=290475>

### Question 2111

Because of the high heat and low humidity in the summer in Death Valley, California, a visitor requires about one quart of water for every two miles traveled on foot. If the density of water is 0.990 g/mL at 45°C, how many kilograms of water are required for a person to walk 30 kilometers in Death Valley?

- A) 8.7 kg
- B) 70 kg
- C)  $3.5 \times 10^2$  kg
- D)  $7.0 \times 10^2$  kg

Answer: <https://biology-forums.com/index.php?topic=288762>

### Question 2112

Calculate the pH of a 0.200 M NaCH<sub>3</sub>CO<sub>2</sub> solution.  $K_a$  for acetic acid, CH<sub>3</sub>CO<sub>2</sub>H, is  $1.8 \times 10^{-5}$ .

- A) 2.72
- B) 4.98
- C) 9.02
- D) 11.28

Answer: <https://biology-forums.com/index.php?topic=290790>

### Question 2113

A compound having A ions on each corner and B ions on each face of a cubic unit cell has the empirical formula \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290183>

### Question 2114

Which requires the most electricity (in terms of faradays of charge transferred) per gram of useful product formed?

- A) electrolysis of aqueous NaCl (chlor-alkali industry)
- B) electrolysis of molten NaCl/CaCl<sub>2</sub> in a Downs cell
- C) electrorefining copper metal
- D) production of aluminum in the Hall-Heroult process

Answer: <https://biology-forums.com/index.php?topic=291167>

### Question 2115

\_\_\_\_\_ are used as a battery electrode material.

- A) Buckyballs
- B) Graphite
- C) Carbon
- D) Sucrose molecules

Answer: <https://biology-forums.com/index.php?topic=290166>

### Question 2116

What is the pH of the solution formed when 25 mL of 0.173 M NaOH is added to 35 mL of 0.342 M HCl?

Answer: <https://biology-forums.com/index.php?topic=290947>

### Question 2117

The element antimony has an atomic weight of 121.757 amu and only two naturally-occurring isotopes. One isotope has an abundance of 57.3% and an isotopic mass of 120.904 amu. Based on these data, what is the mass of the other isotope?

- A) 121.757 amu
- B) 122.393 amu
- C) 122.610 amu
- D) 122.902 amu

Answer: <https://biology-forums.com/index.php?topic=288907>

### Question 2118

A person is considered legally intoxicated with a blood alcohol level of 80 mg/dL. Assuming that blood plasma has a density of 1.025 g/mL, what is this concentration expressed in parts per million?

Answer: <https://biology-forums.com/index.php?topic=290326>

### Question 2119

An element forms a body-centered cubic crystalline substance. The edge length of the unit cell is 287 pm and the density of the crystal is 7.92 g/cm<sup>3</sup>. Calculate the atomic weight of the substance.

- A) 45.0 amu
- B) 48.0 amu
- C) 56.4 amu
- D) 63.5 amu

Answer: <https://biology-forums.com/index.php?topic=290108>

### Question 2120

Neptunium-239 has a half-life of 2.35 days. How many days must elapse for a sample of <sup>239</sup>Np to decay to 1.00% of its original quantity?

- A) 0.0640 days
- B) 0.736 days
- C) 1.36 days
- D) 15.6 days

Answer: <https://biology-forums.com/index.php?topic=291356>

### Question 2121

The coolant in automobiles is often a 50/50 % by volume mixture of ethylene glycol, HOCH<sub>2</sub>CH<sub>2</sub>OH, and water. At 20°C, the density of ethylene glycol is 1.1088 g/mL and the density of water is 0.9982 g/mL. Assuming that the volumes are additive, what is the expected freezing point of a 50/50(v/v)% ethylene glycol/water solution?  $K_f = 1.86^\circ\text{C}/\text{m}$  for water.

- A) -16°C
- B) -17°C
- C) -30°C
- D) -33°C

Answer: <https://biology-forums.com/index.php?topic=290256>

### Question 2122

An element that has the valence electron configuration 3s<sup>2</sup>3p<sup>3</sup> belongs to which period and group?

- A) period 3; group 3A
- B) period 3; group 5A
- C) period 4; group 3A

D) period 4; group 5A

Answer: <https://biology-forums.com/index.php?topic=289507>

### Question 2123

Which of the following species is diamagnetic?

- A) an isolated, gas-phase Ni<sup>2+</sup> ion
- B) a high-spin octahedral Ru<sup>2+</sup> complex
- C) an isolated, gas-phase Co<sup>2+</sup> ion
- D) a low-spin octahedral Os<sup>2+</sup> complex

Answer: <https://biology-forums.com/index.php?topic=291575>

### Question 2124

What is the molecular geometry of TeBr<sub>4</sub>?

- A) seesaw
- B) square planar
- C) square pyramidal
- D) tetrahedral

Answer: <https://biology-forums.com/index.php?topic=289726>

### Question 2125

Three identical flasks contain three different gases at standard temperature and pressure. Flask A contains Ar, flask B contains Ne, flask C contains H<sub>2</sub>. Which flask contains the largest number of molecules?

- A) flask A
- B) flask B
- C) flask C
- D) All flasks contain the same number of molecules.

Answer: <https://biology-forums.com/index.php?topic=289934>

### Question 2126

Which has the smallest atomic radius?

- A) La
- B) W
- C) Os
- D) Hg

Answer: <https://biology-forums.com/index.php?topic=291539>

### Question 2127

Because it forms some H<sup>+</sup> and OCl<sup>-</sup> ions when dissolved in water, the molecule HOCl is classified as a(n) \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289349>

### Question 2128

What is the approximate pH at the equivalence point of a weak acid-strong base titration if 25 mL of aqueous formic acid requires 29.80 mL of 0.2567 M NaOH?  $K_a = 1.8 \times 10^{-4}$  for formic acid.

- A) 2.13
- B) 5.56
- C) 8.44
- D) 11.87

Answer: <https://biology-forums.com/index.php?topic=290906>

### Question 2129

At an elevated temperature,  $K_p = 4.2 \times 10^{-9}$  for the reaction  $2 \text{HBr(g)} \rightleftharpoons \text{H}_2(\text{g}) + \text{Br}_2(\text{g})$ . If the initial partial pressures of HBr, H<sub>2</sub>, and Br<sub>2</sub> are  $1.0 \times 10^{-2}$  atm,  $2.0 \times 10^{-4}$  atm, and  $2.0 \times 10^{-4}$  atm, respectively, what is the equilibrium partial pressure of H<sub>2</sub>?

Answer: <https://biology-forums.com/index.php?topic=290616>

### Question 2130

A 0.050 M solution of hydroxylamine, NH<sub>2</sub>OH, having  $K_b = 9.1 \times 10^{-9}$  has a pH of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290821>

### Question 2131

What is the hydroxide ion concentration of a lye solution that has a pH of 13.20?

- A)  $6.31 \times 10^{-14}$  M
- B)  $1.58 \times 10^{-1}$  M
- C) 0.80 M
- D) 13.20 M

Answer: <https://biology-forums.com/index.php?topic=290759>

### Question 2132

Which of the following statements does not describe a chemical property of oxygen?

- A) Iron will rust in the presence of oxygen.
- B) Oxygen combines with carbon to form carbon dioxide gas.
- C) The pressure is caused by collision of oxygen molecules with the sides of a container.
- D) When coal is burned in oxygen, the process is called combustion.

Answer: <https://biology-forums.com/index.php?topic=288872>

### Question 2133

The chemical process of roasting is commonly used to facilitate the reduction of which metal ores?

- A) Ag, Cu, and Hg
- B) Ag, Mg, and Na
- C) Hg and Pt
- D) Ag, Mn, and V

Answer: <https://biology-forums.com/index.php?topic=291667>

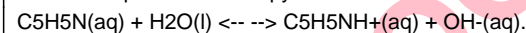
### Question 2134

To the nearest whole number, the number of grams of Ba in 3.25 mol of Ba is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289057>

### Question 2135

What is the pH of a 0.30 M pyridine solution that has a  $K_b = 1.9 \times 10^{-9}$ ? The equation for the dissociation of pyridine is



- A) 4.62
- B) 8.72
- C) 9.38
- D) 10.38

Answer: <https://biology-forums.com/index.php?topic=290705>

### Question 2136

The vapor pressure of a pure liquid increases as the

- A) average kinetic energy of the molecules in the liquid phase decreases.
- B) intermolecular attractive forces increase.
- C) temperature of the liquid phase decreases.
- D) temperature of the liquid phase increases.

Answer: <https://biology-forums.com/index.php?topic=290087>

### Question 2137

Polydentate ligands are known as \_\_\_\_\_ agents.

Answer: <https://biology-forums.com/index.php?topic=291592>

### Question 2138

Which one of the following compounds exhibits the strongest hydrogen bonding between its molecules?

- A) HF
- B) HBr
- C) H<sub>2</sub>O
- D) Ar

Answer: <https://biology-forums.com/index.php?topic=291850>

### Question 2139

What statement about nitrogen is not consistent with its chemistry?

- A) It is a colorless, odorless, tasteless gas.

- B) It makes up 78% of the earth's atmosphere by volume.  
C) It is the most volatile component of liquid air with a boiling point of  $-196^{\circ}\text{C}$ .  
D) It readily reacts with hydrogen to form  $\text{NH}_3$  that is used in fertilizers.

Answer: <https://biology-forums.com/index.php?topic=291782>

### Question 2140

What is the average oxidation number of Cu in the 1-2-3 superconductor  $\text{YBa}_2\text{Cu}_3\text{O}_7$  if Y is in the +3 oxidation state?

- A) +2  
B) +2.33  
C) +0.67  
D) +4.33

Answer: <https://biology-forums.com/index.php?topic=291678>

### Question 2141

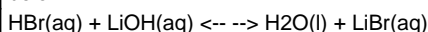
A solution of 0.2113 g of water dissolved in 25.0 g of a solvent freezes at  $11.5^{\circ}\text{C}$  below the freezing point of the solvent. What is  $K_f$  for this solvent?

- A)  $0.735^{\circ}\text{C}/\text{m}$   
B)  $1.36^{\circ}\text{C}/\text{m}$   
C)  $5.39^{\circ}\text{C}/\text{m}$   
D)  $24.5^{\circ}\text{C}/\text{m}$

Answer: <https://biology-forums.com/index.php?topic=290252>

### Question 2142

What is the approximate value of the equilibrium constant,  $K_n$ , for the neutralization of hydrochloric acid with sodium hydroxide, shown in the equation below?



- A)  $1.0 \times 10^2$   
B)  $1.0 \times 10^7$   
C)  $1.0 \times 10^{14}$   
D)  $1.0 \times 10^{28}$

Answer: <https://biology-forums.com/index.php?topic=290889>

### Question 2143

What mass of carbon monoxide,  $\text{CO}$ , contains the same number of molecules as 3.00 g of trichlorofluoromethane,  $\text{CCl}_3\text{F}$ ?

- A) 3.00 g  
B) 0.612 g  
C) 1.63 g  
D) 9.33 g

Answer: <https://biology-forums.com/index.php?topic=289087>

### Question 2144

Which of the following chromium species is the strongest acid?

- A)  $\text{Cr}(\text{OH})_2$   
B)  $\text{Cr}(\text{OH})_3$   
C)  $\text{CrO}_2(\text{OH})_2$   
D)  $\text{CrO}_4^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291497>

### Question 2145

Which covalent bond is the most polar?

- A)  $\text{H}-\text{I}$   
B)  $\text{H}-\text{F}$   
C)  $\text{H}-\text{Cl}$   
D)  $\text{H}-\text{Br}$

Answer: <https://biology-forums.com/index.php?topic=289739>

### Question 2146

Which of the following statements about mass spectrometry is false?

- A) Mass spectrometry can be used to determine the molecular weight of a compound.  
B) The curvature of the path in a magnetic field is determined by the mass of the ion.  
C) The paths of heavier ions are deflected more strongly than the paths of lighter ions.

D) The sample is changed into positively charged ions.

Answer: <https://biology-forums.com/index.php?topic=289124>

### Question 2147

A balloon contains 0.76 mol N<sub>2</sub>, 0.18 mol Ar, 0.031 mol He, and 0.026 mol H<sub>2</sub> at 739 mm Hg. What is the partial pressure of Ar?

- A) 19 mm Hg
- B) 23 mm Hg
- C) 130 mm Hg
- D) 560 mm Hg

Answer: <https://biology-forums.com/index.php?topic=289957>

### Question 2148

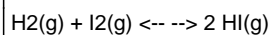
What is the molar solubility of Mg(OH)<sub>2</sub> in a basic solution with a pH of 12.00? K<sub>sp</sub> for Mg(OH)<sub>2</sub> is

- A)  $5.6 \times 10^{-10}$  M
- B)  $5.6 \times 10^{-8}$  M
- C)  $2.4 \times 10^{-6}$  M
- D)  $1.1 \times 10^{-4}$  M

Answer: <https://biology-forums.com/index.php?topic=290872>

### Question 2149

K<sub>c</sub> = 57.0 at 700 K for the reaction shown below.



If [H<sub>2</sub>(g)] = [I<sub>2</sub>(g)] = 0.200 M at equilibrium, the molar concentration [HI(g)] = \_\_\_\_\_ at equilibrium.

Answer: <https://biology-forums.com/index.php?topic=290613>

### Question 2150

Choose the words that best complete the following sentence.

The \_\_\_\_\_ the binding energy, the \_\_\_\_\_ stable the nucleus.

- A) larger, less
- B) larger, more
- C) smaller, less
- D) smaller, more

Answer: <https://biology-forums.com/index.php?topic=291374>

### Question 2151

Identify the ether.

- A) CH<sub>3</sub>CH<sub>2</sub>OCH<sub>3</sub>
- B) CH<sub>3</sub>CH<sub>2</sub>CH=CH<sub>2</sub>
- C) CH<sub>3</sub>CH<sub>2</sub>OH
- D) CH<sub>3</sub>CH<sub>2</sub>NHCH<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=291997>

### Question 2152

A supercritical fluid refers to a substance

- A) above both its critical temperature and its critical pressure.
- B) at its triple point.
- C) that is in the liquid crystal state.
- D) with a viscosity of zero.

Answer: <https://biology-forums.com/index.php?topic=290123>

### Question 2153

The nuclear decay process that involves the particle having the greatest mass is \_\_\_\_\_ emission.

- A) alpha
- B) beta
- C) gamma
- D) positron

Answer: <https://biology-forums.com/index.php?topic=291318>

### Question 2154

Which has the lowest melting point?

- A) La
- B) W
- C) Os
- D) Hg

Answer: <https://biology-forums.com/index.php?topic=291537>

### Question 2155

Relative to a bulk sample of gold, nanoparticles of gold have

- A) greater reactivity and higher melting point.
- B) greater reactivity and lower melting point.
- C) lower reactivity and higher melting point.
- D) lower reactivity and lower melting point.

Answer: <https://biology-forums.com/index.php?topic=291653>

### Question 2156

What is the mole fraction of ethanol in a solution made by dissolving 25.0 g of ethanol, C<sub>2</sub>H<sub>5</sub>OH, in 53.6 g of water?

- A) 0.154
- B) 0.846
- C) 0.214
- D) 0.272

Answer: <https://biology-forums.com/index.php?topic=290204>

### Question 2157

Molarity is defined as moles of solute per

- A) kilogram of solvent.
- B) liter of solution.
- C) mole of solute.
- D) total moles present.

Answer: <https://biology-forums.com/index.php?topic=290296>

### Question 2158

Which acid of the following set has the strongest conjugate base?

- A) CH<sub>4</sub>
- B) NH<sub>3</sub>
- C) H<sub>2</sub>S
- D) HCl

Answer: <https://biology-forums.com/index.php?topic=290744>

### Question 2159

Identify a chemical property.

- A) tarnishing
- B) boiling point
- C) taste
- D) solubility

Answer: <https://biology-forums.com/index.php?topic=288943>

### Question 2160

The number of electrons in the ion K<sup>+</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289570>

### Question 2161

Which is expected to have the highest surface tension at 25°?

- A) C<sub>7</sub>H<sub>16</sub>
- B) C<sub>8</sub>H<sub>10</sub>
- C) C<sub>5</sub>H<sub>11</sub>OH
- D) C<sub>3</sub>H<sub>5</sub>(OH)<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290135>

### Question 2162

The cycloalkane represented by a square is called \_\_\_\_\_ and has the molecular formula \_\_\_\_\_.

- A) cyclopropane, C<sub>3</sub>H<sub>6</sub>
- B) cyclopropane, C<sub>3</sub>H<sub>8</sub>
- C) cyclobutane, C<sub>4</sub>H<sub>4</sub>
- D) cyclobutane, C<sub>4</sub>H<sub>8</sub>

Answer: <https://biology-forums.com/index.php?topic=291941>

### Question 2163

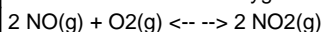
Calcium belongs to the \_\_\_\_\_ group of the periodic table.

- A) alkali metal
- B) alkaline earth metal
- C) halogen
- D) noble gas

Answer: <https://biology-forums.com/index.php?topic=288948>

### Question 2164

Nitric oxide reacts with oxygen to form nitrogen dioxide:



What is K<sub>c</sub> for the forward reaction if the equilibrium concentration of NO is 0.200 M, O<sub>2</sub> is 0.100 M, and NO<sub>2</sub> is 0.200 M at 25°C?

- A) 35
- B) 0.200
- C) 0.10
- D) 10.0

Answer: <https://biology-forums.com/index.php?topic=290567>

### Question 2165

Which of the following scenarios involves a transfer of heat from system to surroundings?

- A) evaporating rubbing alcohol from your skin
- B) solidifying molten gold into a gold bar
- C) melting solid gallium metal with heat from your hand
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=289795>

### Question 2166

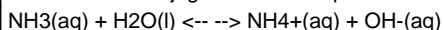
Which of the following statements is not a postulate of Dalton's atomic theory?

- A) Each element is characterized by the mass of its atoms.
- B) Atoms are composed of protons, neutrons, and electrons.
- C) Chemical reactions only rearrange atomic combinations.
- D) Elements are composed of atoms.

Answer: <https://biology-forums.com/index.php?topic=288883>

### Question 2167

What are the conjugate acid-base pairs in the following chemical reaction?



- A) NH<sub>3</sub>, H<sub>2</sub>O and NH<sub>4</sub><sup>+</sup>, OH<sup>-</sup>
- B) NH<sub>3</sub>, NH<sub>4</sub><sup>+</sup> and H<sub>2</sub>O, OH<sup>-</sup>
- C) NH<sub>3</sub>, OH<sup>-</sup> and H<sub>2</sub>O, NH<sub>4</sub><sup>+</sup>
- D) NH<sub>3</sub> and NH<sub>4</sub><sup>+</sup>

Answer: <https://biology-forums.com/index.php?topic=290630>

### Question 2168

Which of the following species will have the highest ionization energy?

- A) Rb<sup>+</sup>
- B) Kr
- C) Br<sup>-</sup>
- D) Se<sup>2-</sup>

Answer: <https://biology-forums.com/index.php?topic=289538>



### Question 2169

Which one of the following contains 38.7% carbon by mass?

- A) C<sub>2</sub>H<sub>2</sub>
- B) CH<sub>4</sub>
- C) CH<sub>3</sub>NH<sub>2</sub>
- D) CO<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289110>

### Question 2170

The layers of graphite are held together by

- A) covalent bonds.
- B) ion-ion forces.
- C) London dispersion forces.
- D) cationic forces.

Answer: <https://biology-forums.com/index.php?topic=290164>

### Question 2171

Sodium phosphate reacts with sulfuric acid to form sodium sulfate and phosphoric acid. What is the stoichiometric coefficient for sulfuric acid when the chemical equation is balanced using the lowest whole-number stoichiometric coefficients?

- A) 1
- B) 2
- C) 3
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=289074>

### Question 2172

At 55° the decomposition of N<sub>2</sub>O<sub>5</sub> is first order, having a rate constant,  $k = 1.7 \times 10^{-3} \text{ s}^{-1}$ . If the initial concentration of N<sub>2</sub>O<sub>5</sub> is  $6.4 \times 10^{-3} \text{ M}$ , the number of half-lives that are required for the N<sub>2</sub>O<sub>5</sub> concentration to fall to  $2.0 \times 10^{-4} \text{ M}$  is \_\_\_\_\_, and the amount of time required is \_\_\_\_\_ minutes.

Answer: <https://biology-forums.com/index.php?topic=290473>

### Question 2173

At 50°C the value of  $K_w$  is  $5.5 \times 10^{-14}$ , and the pH of a neutral solution at 50°C is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290809>

### Question 2174

Which compound exhibits pi bonding?

- A) I<sub>2</sub>
- B) C<sub>2</sub>
- C) P<sub>4</sub>
- D) S<sub>8</sub>

Answer: <https://biology-forums.com/index.php?topic=291853>

### Question 2175

What is the total pressure in a 8.00-L flask which contains 0.127 mol of H<sub>2</sub>(g) and 0.288 mol of N<sub>2</sub>(g) at 20.0°C?

- A) 0.382 atm
- B) 0.681 atm
- C) 0.866 atm
- D) 1.25 atm

Answer: <https://biology-forums.com/index.php?topic=290022>

### Question 2176

Which of the following represent electron configurations that violate the Pauli exclusion principle?

- (A) [Ne]3s<sup>1</sup>3p<sup>5</sup> (B) [Kr]4d<sup>1</sup>2s<sup>2</sup>5p<sup>6</sup> (C) [Ar]3d<sup>10</sup>4s<sup>2</sup>4p<sup>2</sup>
- A) only (A)
- B) only (B)
- C) (A) and (B)
- D) (B) and (C)

Answer: <https://biology-forums.com/index.php?topic=289428>

### Question 2177

Identify the saturated compound, assuming none of the structures are rings.

- A) C<sub>3</sub>H<sub>6</sub>
- B) C<sub>3</sub>H<sub>8</sub>
- C) alkyne
- D) C<sub>7</sub>H<sub>12</sub>

Answer: <https://biology-forums.com/index.php?topic=292012>

### Question 2178

You have two samples of the same gas in the same size container, with the same pressure. The gas in the first container has a Kelvin temperature four times that of the gas in the other container. The ratio of the number of moles of gas in the first container compared to that in the second is

- A) 1:1.
- B) 1:2.
- C) 1:4.
- D) 4:1.

Answer: <https://biology-forums.com/index.php?topic=289932>

### Question 2179

For hydrogen, what is the wavelength of the photon emitted when an electron drops from a 3d orbital to a 2p orbital in a hydrogen atom? The Rydberg constant is  $1.097 \times 10^{-2} \text{ nm}^{-1}$ .

- A) 656.3 nm
- B) 486.2 nm
- C) 364.6 nm
- D)  $2.057 \times 10^{-3} \text{ nm}$

Answer: <https://biology-forums.com/index.php?topic=289368>

### Question 2180

Which of the following compounds has the highest boiling point?

- A) H<sub>2</sub>O
- B) HCl
- C) N<sub>2</sub>
- D) Ar

Answer: <https://biology-forums.com/index.php?topic=290143>

### Question 2181

Which atomic orbitals are involved in bonding and which as lone pair orbitals for N<sub>2</sub>H<sub>2</sub>?

H — = — H

- A) bonding: s on H, sp<sup>2</sup> on N lone pair: p on N
- B) bonding: sp<sup>2</sup> on both H and N lone pair: p on N
- C) bonding: s on H, p on N lone pair: sp<sup>2</sup> on N
- D) bonding: s on H, sp<sup>2</sup> and p on N lone pair: sp<sup>2</sup> on N

Answer: <https://biology-forums.com/index.php?topic=289678>

### Question 2182

What is the percent dissociation of glycine if the solution has a pH = 8.60 and a pK<sub>a</sub> = 9.60?

- A) 50%
- B) 9%
- C) 5%
- D) 1%

Answer: <https://biology-forums.com/index.php?topic=290846>

### Question 2183

In an electron capture reaction a proton is converted into a \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291460>

### Question 2184

Phosphorus pentachloride decomposes to phosphorus trichloride at high temperatures according to the equation:



At 250° 0.250 M PCl<sub>5</sub> is added to the flask. If K<sub>c</sub> = 1.80, what are the equilibrium concentrations of each gas?

- A) [PCl<sub>5</sub>] = 0.0280 M, [PCl<sub>3</sub>] = 0.222 M, and [Cl<sub>2</sub>] = 0.222 M
- B) [PCl<sub>5</sub>] = 0.125 M, [PCl<sub>3</sub>] = 0.474 M, and [Cl<sub>2</sub>] = 0.474 M
- C) [PCl<sub>5</sub>] = 1.80 M, [PCl<sub>3</sub>] = 1.80 M, and [Cl<sub>2</sub>] = 1.80 M
- D) [PCl<sub>5</sub>] = 2.27 M, [PCl<sub>3</sub>] = 2.02 M, and [Cl<sub>2</sub>] = 2.02 M

Answer: <https://biology-forums.com/index.php?topic=290583>

### Question 2185

What is the pH of a 0.020 M HClO<sub>4</sub> solution?

- A) 0.020
- B) 0.040
- C) 1.70
- D) 12.30

Answer: <https://biology-forums.com/index.php?topic=290671>

### Question 2186

What minerals are important commercial sources of metals?

- A) silicates
- B) chlorides
- C) nitrates
- D) oxides

Answer: <https://biology-forums.com/index.php?topic=291655>

### Question 2187

What volume of 3.00 M CH<sub>3</sub>OH solution is needed to provide 0.500 mol of CH<sub>3</sub>OH?

- A) 3.12 mL
- B) 9.38 mL
- C) 167 mL
- D) 150 mL

Answer: <https://biology-forums.com/index.php?topic=290216>

### Question 2188

What is the hydroxide ion concentration and the pH for a hydrochloric acid solution that has a hydronium ion concentration of 1.50 × 10<sup>-4</sup> M?

- A) 6.67 × 10<sup>-10</sup> M, 4.82
- B) 6.67 × 10<sup>-10</sup> M, 9.18
- C) 6.67 × 10<sup>-11</sup> M, 3.82
- D) 6.67 × 10<sup>-11</sup> M, 10.18

Answer: <https://biology-forums.com/index.php?topic=290661>

### Question 2189

Units used for measuring radiation include the becquerel, the curie, the gray, and the sievert, which have the abbreviations \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=291473>

### Question 2190

A galvanic cell consists of a La<sup>3+</sup>/La half-cell and a standard hydrogen electrode. If the La<sup>3+</sup>/La half-cell standard cell functions as the anode, and the standard cell potential is 2.52 V, what is the standard reduction potential for the La<sup>3+</sup>/La half-cell?

- A) -2.52 V
- B) -0.84 V
- C) +0.84 V
- D) +2.52 V

Answer: <https://biology-forums.com/index.php?topic=291117>

### Question 2191

Wollastonite, CaSiO<sub>3</sub>, is an example of a(n) \_\_\_\_\_ silicate.

Answer: <https://biology-forums.com/index.php?topic=291917>

### Question 2192

Which of the following is most likely to have the highest viscosity at 25°C?

- A) C<sub>6</sub>H<sub>14</sub>
- B) HOCH<sub>2</sub>CH<sub>2</sub>OH
- C) C<sub>3</sub>H<sub>7</sub>OH
- D) C<sub>7</sub>H<sub>8</sub>

Answer: <https://biology-forums.com/index.php?topic=290134>

### Question 2193

The percent dissociation of acetic acid changes as the concentration of the acid decreases. A 100-fold decrease in acetic acid concentration results in a \_\_\_\_\_ fold \_\_\_\_\_ in the percent dissociation.

- A) 10, increase
- B) 10, decrease
- C) 100, increase
- D) 100, decrease

Answer: <https://biology-forums.com/index.php?topic=290695>

### Question 2194

Which is expected to have the lowest specific heat capacity at 25°C?

- A) air
- B) gold
- C) ethylene glycol
- D) methanol

Answer: <https://biology-forums.com/index.php?topic=289869>

### Question 2195

Calculate the solubility (in g/L) of calcium fluoride in water at 25°C if the K<sub>sp</sub> for Ca F<sub>2</sub> is  $3.5 \times 10^{-10}$ .

- A)  $9.6 \times 10^{-4}$  g/L
- B)  $2.1 \times 10^{-4}$  g/L
- C)  $3.3 \times 10^{-2}$  g/L
- D)  $4.1 \times 10^{-2}$  g/L

Answer: <https://biology-forums.com/index.php?topic=290919>

### Question 2196

All of the following elements are nonmetals except

- A) copper.
- B) nitrogen.
- C) krypton.
- D) phosphorus.

Answer: <https://biology-forums.com/index.php?topic=288964>

### Question 2197

Calculate the kinetic energy of a 150-g baseball moving at a speed of 38. m/s (85 mph).

- A) 5.7 J
- B)  $1.1 \times 10^2$  J
- C)  $5.7 \times 10^3$  J
- D)  $1.1 \times 10^5$  J

Answer: <https://biology-forums.com/index.php?topic=288819>

### Question 2198

How many anions are in 10.0 g of sodium phosphate?

- A)  $3.67 \times 10^{22}$  cations
- B)  $1.10 \times 10^{23}$  cations
- C)  $9.87 \times 10^{24}$  cations
- D)  $2.96 \times 10^{25}$  cations

Answer: <https://biology-forums.com/index.php?topic=289090>

### Question 2199

Based on the variation in Z<sub>eff</sub>, which oxoanion should be the weakest oxidizing agent?

- A) VO<sub>4</sub><sup>3-</sup>
- B) CrO<sub>4</sub><sup>2-</sup>

C)  $\text{MnO}_4^{2-}$

D)  $\text{FeO}_4^{2-}$

Answer: <https://biology-forums.com/index.php?topic=291534>

### Question 2200

Why are ceramics superior to metals as structural materials?

A) Ceramics are easier to fabricate into shapes than metals.

B) Ceramics are more malleable than metals.

C) Ceramics are more resistant to wear and corrosion than metals.

D) Ceramics have greater impact resistance than metals.

Answer: <https://biology-forums.com/index.php?topic=291645>

### Question 2201

A researcher needs 5.00 mg of  $^{128}\text{Ba}$  for an experiment. If the half-life of  $^{128}\text{Ba}$  is 2.43 days, how many milligrams of  $^{128}\text{BaCl}_2$  must she order from the manufacturer if it takes 4.50 days to ship the material from the manufacturer to the university? (Assume the molar mass of  $^{128}\text{Ba}$  is 128 g/mol.)

A) 11.6 mg

B) 18.0 mg

C) 21.5 mg

D) 44.9 mg

Answer: <https://biology-forums.com/index.php?topic=291363>

### Question 2202

Which of the following statements is true for a supersaturated solution?

A) The solute in the solution is at equilibrium with undissolved solute.

B) The solution contains more than the equilibrium amount of solute.

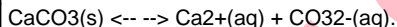
C) The solution is stable and the solute will not precipitate.

D) A supersaturated solution is more than 50% solute by mass.

Answer: <https://biology-forums.com/index.php?topic=290234>

### Question 2203

Calcium carbonate is relatively insoluble and the dissolution reaction is endothermic:



Which change in reaction condition below will shift the equilibrium to the right?

A) add an acid to react with  $\text{CO}_3^{2-}$  ion

B) add an anion with which  $\text{Ca}^{2+}$  is even less soluble than calcium carbonate

C) increase the temperature

D) All of these will shift reaction to the right.

Answer: <https://biology-forums.com/index.php?topic=290556>

### Question 2204

Which compound has carbon with a negative oxidation number?

A)  $\text{CO}_2$

B)  $\text{CaC}_2$

C)  $\text{HCN}$

D)  $\text{Li}_2\text{CO}_3$

Answer: <https://biology-forums.com/index.php?topic=291879>

### Question 2205

Which atom in each group (I and II) has the smallest atomic radius?

(I) K, Zn, Br (II) Al, Ga, In

A) K; Al

B) K; In

C) Br; Al

D) Br; In

Answer: <https://biology-forums.com/index.php?topic=289450>

### Question 2206

Which statement is true concerning the standard states of  $\text{F}_2(\text{g})$  and  $\text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{aq})$ ?

A) The standard state for  $\text{F}_2(\text{g})$  is the pure gas at 1 atm and for  $\text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{aq})$  is the pure solid at 1 atm.

B) The standard state for  $\text{F}_2(\text{g})$  is the pure gas at 1 mol/L and for  $\text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{aq})$  is the pure solid at 1 atm.

C) The standard state for  $F_2(g)$  is the pure gas at 1 atm and for  $C_{12}H_{22}O_{11}(aq)$  is the solution at a concentration of 1 mol/L.  
D) The standard state for  $F_2(g)$  is the pure gas at 1 mol/L and for  $C_{12}H_{22}O_{11}(aq)$  is the solution at a concentration of 1 mol/L.  
Answer: <https://biology-forums.com/index.php?topic=291047>

### Question 2207

How many electrons are in the ion,  $SO_4^{2-}$ ?

- A) 26
- B) 46
- C) 48
- D) 50

Answer: <https://biology-forums.com/index.php?topic=289001>

### Question 2208

The normal boiling point of pure benzene is found to be  $80.10^\circ C$ . What is the approximate molecular weight of a nonionizing substance if a solution of 3.55 g of the substance dissolved in 100. g of benzene has a normal boiling point of  $80.19^\circ C$ ?  $K_b = 5.12^\circ C/m$  for benzene,  $C_6H_6$ .

- A) 20 amu
- B) 500 amu
- C) 2000 amu
- D) 20,000 amu

Answer: <https://biology-forums.com/index.php?topic=290250>

### Question 2209

What volume of a 0.540 M KOH solution contains 15.5 g of KOH?

- A) 0.54 L
- B) 0.51 L
- C) 1.95 L
- D) 8.47 L

Answer: <https://biology-forums.com/index.php?topic=289208>

### Question 2210

What is the pH of a 0.100 M  $NH_3$  solution that has  $K_b = 1.8 \times 10^{-5}$ ? The equation for the dissociation of  $NH_3$  is  $NH_3(aq) + H_2O(l) \rightleftharpoons NH_4^+(aq) + OH^-(aq)$ .

- A) 1.87
- B) 2.87
- C) 11.13
- D) 12.13

Answer: <https://biology-forums.com/index.php?topic=290704>

### Question 2211

An element, X is formed by bombardment of uranium-238 atoms with a beta particle. How many neutrons are produced by this reaction?

- A) 3
- B) 2
- C) 1
- D) 0

Answer: <https://biology-forums.com/index.php?topic=291391>

### Question 2212

The sugar fructose has an empirical formula of  $CH_2O$ . The mass spectrum shows a molecular ion peak at a mass of 179.9. What is the molecular formula of fructose?

- A)  $CH_2O$
- B)  $C_2H_4O_4$
- C)  $C_6H_{11}O_6$
- D)  $C_6H_{12}O_6$

Answer: <https://biology-forums.com/index.php?topic=289122>

### Question 2213

How many protons (p), neutrons (n), and electrons (e) are in one atom of Mg?

- A) 12 p, 12 n, 12 e
- B) 12 p, 11 n, 12 e
- C) 12 p, 11 n, 10 e

D) 12 p, 11 n, 14 e

Answer: <https://biology-forums.com/index.php?topic=288898>

### Question 2214

Why is  $\text{H}_3\text{PO}_4$  a weak triprotic acid whereas  $\text{H}_3\text{PO}_3$  is a weak diprotic acid?

Answer: <https://biology-forums.com/index.php?topic=291923>

### Question 2215

The color exhibited by coordination compounds is usually due to the absorption of light by a d-electron, resulting in the promotion of the d-electron from its ground-state d-orbital to a higher energy orbital. The first transition series element expected to have a colorless aqueous solution  $\text{M}^{2+}$  ion is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291594>

### Question 2216

Which group of elements reacts violently with water?

- A) halogens
- B) noble gases
- C) alkali metals
- D) alkaline earth metals

Answer: <https://biology-forums.com/index.php?topic=288874>

### Question 2217

When 70 mL of 0.18 M  $\text{NH}_4\text{Cl}$  is added to 70 mL of 0.18 M  $\text{NH}_3$ , relative to the pH of the 0.10 M  $\text{NH}_3$  solution the pH of the resulting solution will

- A) become 7.
- B) decrease.
- C) increase.
- D) remain the same.

Answer: <https://biology-forums.com/index.php?topic=290898>

### Question 2218

Determine the number of water molecules necessary to balance the reduction half reaction of \_\_\_\_\_ that occurs in a basic solution.

- A) 2
- B) 3
- C) 4
- D) 5

Answer: <https://biology-forums.com/index.php?topic=291082>

### Question 2219

The observation that 4.0 g of hydrogen reacts with 32.0 g of oxygen to form a product with O:H mass ratio = 8:1, and 6.0 g of hydrogen reacts with 48.0 g of oxygen to form the same product with O:H mass ratio = 8:1 is evidence for the law of

- A) definite proportions.
- B) energy conservation.
- C) mass conservation.
- D) multiple proportions.

Answer: <https://biology-forums.com/index.php?topic=288877>

### Question 2220

When dissolved in water, which of the following compounds is an Arrhenius base?

- A)  $\text{CH}_3\text{OH}$
- B)  $\text{HOCl}$
- C)  $\text{NaOH}$
- D)  $\text{CsF}$

Answer: <https://biology-forums.com/index.php?topic=290733>

### Question 2221

Which group 5A element is most metallic?

- A) N
- B) P
- C) Sb

D) Bi

Answer: <https://biology-forums.com/index.php?topic=288873>

### Question 2222

An unknown gas effuses 2.3 times faster than  $\text{N}_2\text{O}_4$  at the same temperature. What is the identity of the unknown gas?

- A)  $\text{CN}_2$
- B)  $\text{NH}_3$
- C)  $\text{N}_2\text{O}$
- D)  $\text{O}_3$

Answer: <https://biology-forums.com/index.php?topic=289974>

### Question 2223

Vinegar is a 5.0% solution by weight of acetic acid ( $\text{CH}_3\text{CO}_2\text{H}$ ) in water. Given that  $K_a = 1.8 \times 10^{-5}$  for acetic acid and assuming the density of vinegar to be  $1.00 \text{ g/cm}^3$ , what is the pH of this vinegar solution?

- A) 2.00
- B) 2.41
- C) 2.87
- D) 4.74

Answer: <https://biology-forums.com/index.php?topic=290692>

### Question 2224

What is the empirical formula for ethyl fluoride if the compound contains 49.97% carbon, 10.51% hydrogen, and 39.52% fluorine by mass?

- A)  $\text{C}_2\text{H}_5\text{F}$
- B)  $\text{C}_4\text{H}_{10}\text{F}_2$
- C)  $\text{C}_4\text{H}_{10}\text{F}_4$
- D)  $\text{C}_2\text{H}_5\text{F}_2$

Answer: <https://biology-forums.com/index.php?topic=289112>

### Question 2225

The loss in mass that occurs when protons and neutrons combine to form a nucleus is called the \_\_\_\_\_ of the nucleus, and the corresponding energy released during the formation of that nucleus is the \_\_\_\_\_ that holds the nucleus together.

Answer: <https://biology-forums.com/index.php?topic=291463>

### Question 2226

Identify the compounds that have at least one  $\text{sp}^2$  hybridized carbon.

- A) 1-pentyne
- B) propane
- C) 2-butene
- D) 3-chloropentane

Answer: <https://biology-forums.com/index.php?topic=292018>

### Question 2227

The SI unit for energy is the \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289889>

### Question 2228

What is the oxidation number of the chromium atom in  $\text{K}_2\text{Cr}_2\text{O}_4$ ?

- A) -2
- B) +3
- C) +6
- D) +7

Answer: <https://biology-forums.com/index.php?topic=289248>

### Question 2229

Transition elements are located in the \_\_\_\_\_-block of the periodic table.

Answer: <https://biology-forums.com/index.php?topic=291578>

### Question 2230

What is the edge length of a face-centered cubic unit cell made up of atoms having a radius of  $139 \text{ pm}$ ?



- A) 197 pm
- B) 393 pm
- C) 556 pm
- D) 1110 pm

Answer: <https://biology-forums.com/index.php?topic=290156>

### Question 2231

Which is the crystal field energy level diagram for a square planar  $ML_4$  complex that contains no ligands on the z-axis?

- A) (A)
- B) (B)
- C) (C)
- D) (D)

Answer: <https://biology-forums.com/index.php?topic=291543>

### Question 2232

If the pressure in a gas container that is connected to an open-end U-tube manometer is 106 kPa and the pressure of the atmosphere at the open end of the tube is 700 mm Hg, the level of mercury in the tube will be

- A) 95 mm higher in the arm open to the atmosphere.
- B) 95 mm higher in the arm connected to the gas cylinder.
- C) 795 mm higher in the arm open to the atmosphere.
- D) 795 mm higher in the arm connected to the gas cylinder.

Answer: <https://biology-forums.com/index.php?topic=289919>

### Question 2233

The mass of a proton is  $1.67 \times 10^{-27}$  kg. What is the mass of a proton in Gigagrams?

- A)  $1.67 \times 10^{-39}$  Gg
- B)  $1.67 \times 10^{-36}$  Gg
- C)  $1.67 \times 10^{-33}$  Gg
- D)  $1.67 \times 10^{-30}$  Gg

Answer: <https://biology-forums.com/index.php?topic=288742>

### Question 2234

When dissolved in water, which of the following compounds is an Arrhenius acid?

- A) HCN
- B) NaOH
- C) NaF
- D)  $CH_3CH_2OH$

Answer: <https://biology-forums.com/index.php?topic=290627>

### Question 2235

Which metal is not found in nature in uncombined form?

- A) Mn
- B) Au
- C) Os
- D) Ir

Answer: <https://biology-forums.com/index.php?topic=291664>

### Question 2236

The four lines observed in the visible emission spectrum of hydrogen tell us that

- A) The hydrogen molecules they came from have the formula  $H_4$ .
- B) We could observe more lines if we had a stronger prism.
- C) There are four electrons in an excited hydrogen atom.
- D) Only certain energies are allowed for the electron in a hydrogen atom.

Answer: <https://biology-forums.com/index.php?topic=289372>

### Question 2237

An element has two naturally occurring isotopes. One has an abundance of 37.4% and an isotopic mass of 184.953 amu, and the other has an abundance of 62.6% and a mass of 186.956 amu. What is the atomic weight of the element?

- A) 185.702 amu
- B) 185.954 amu

C) 186.207 amu

D) 186.956 amu

Answer: <https://biology-forums.com/index.php?topic=288906>

### Question 2238

What is the mass of a single ozone molecule, O<sub>3</sub>?

A)  $2.656 \times 10^{-23}$  g

B)  $7.969 \times 10^{-22}$  g

C) 16.0 g

D) 48.0 g

Answer: <https://biology-forums.com/index.php?topic=289080>

### Question 2239

What is the hydroxide ion concentration of a lye solution that has a pH of 11.20?

A)  $6.31 \times 10^{-12}$  M

B)  $1.58 \times 10^{-3}$  M

C) 2.80 M

D) 11.20 M

Answer: <https://biology-forums.com/index.php?topic=290664>

### Question 2240

Which of the following molecules is the most highly oxidized, in other words, the one with the most number of C-O bonds?

A) acetaldehyde

B) ethanoic acid

C) dimethyl ether

D) ethylene

Answer: <https://biology-forums.com/index.php?topic=291991>

### Question 2241

A solution of LiCl in water has  $X_{\text{LiCl}} = 0.0800$ . What is the molality?

A) 4.01 m LiCl

B) 4.44 m LiCl

C) 4.83 m LiCl

D) 8.70 m LiCl

Answer: <https://biology-forums.com/index.php?topic=290291>

### Question 2242

What is the selenide ion concentration [Se<sup>2-</sup>] for a 0.400 M H<sub>2</sub>Se solution that has the stepwise dissociation constants of  $K_{a1} = 1.3 \times 10^{-4}$  and  $K_{a2} = 1.0 \times 10^{-11}$ ?

A)  $7.2 \times 10^{-3}$  M

B)  $1.3 \times 10^{-4}$  M

C)  $5.2 \times 10^{-5}$  M

D)  $1.0 \times 10^{-11}$  M

Answer: <https://biology-forums.com/index.php?topic=290780>

### Question 2243

The HBr bond has a length of 141 pm and 12.1% ionic character. What is the dipole moment of HBr?

Answer: <https://biology-forums.com/index.php?topic=289767>

### Question 2244

According to Graham's law, the rate of effusion of a gas is inversely proportional to the \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290067>

### Question 2245

A 1.0 m aqueous BaI<sub>2</sub> solution will have a \_\_\_\_\_ vapor pressure, \_\_\_\_\_ freezing point, and \_\_\_\_\_ boiling point than a 1.0 m aqueous solution of LiI.

Answer: <https://biology-forums.com/index.php?topic=290345>

### Question 2246

The ion that has 28 protons and 26 electrons is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289568>

### Question 2247

Which one of the following salts, when dissolved in water, produces the solution with the lowest pH?

- A) RbCl
- B) NH<sub>4</sub>Cl
- C) SrCl<sub>2</sub>
- D) AlCl<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290797>

### Question 2248

The equivalence point pH of the titration of four weak bases is given. Which is the strongest base?

- A) 4.20
- B) 6.10
- C) 6.40
- D) 7.90

Answer: <https://biology-forums.com/index.php?topic=290916>

### Question 2249

Which of the following can function as a chelating agent?

- A) I<sup>-</sup>
- B) NH<sub>3</sub>
- C) C<sub>2</sub>O<sub>4</sub><sup>2-</sup>
- D) H<sub>2</sub>O

Answer: <https://biology-forums.com/index.php?topic=291566>

### Question 2250

If the mass of one neutron is 1.00866 amu, the mass of one proton is 1.00728 amu, and the mass of <sup>14</sup>C nucleus is 13.99995 amu, calculate the binding energy for the <sup>14</sup>C nucleus.

- A)  $9.92 \times 10^9$  kJ/mol
- B)  $1.02 \times 10^{10}$  kJ/mol
- C)  $5.54 \times 10^{11}$  kJ/mol
- D)  $5.95 \times 10^{11}$  kJ/mol

Answer: <https://biology-forums.com/index.php?topic=291370>

### Question 2251

The meter is closest in length to the English system unit the \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=288849>

### Question 2252

Aluminum requires relatively little protection from corrosion because

- A) aluminum has little tendency to react with oxygen.
- B) the reduction potential for Al<sup>3+</sup>/Al is very low.
- C) the oxidation of aluminum produces a hard, relatively impenetrable film of Al<sub>2</sub>O<sub>3</sub>.
- D) aluminum is protected by cathodic protection.

Answer: <https://biology-forums.com/index.php?topic=291157>

### Question 2253

Which is a net ionic equation for the neutralization of a strong acid with a strong base?

- A)  $\text{HI}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NaI}(\text{aq})$
- B)  $\text{H}_3\text{O}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow 2 \text{H}_2\text{O}(\text{l})$
- C)  $\text{HF}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NaF}(\text{aq})$
- D)  $\text{HCl}(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{Cl}^-(\text{aq})$

Answer: <https://biology-forums.com/index.php?topic=290883>

### Question 2254

When a person exhales through a straw into water, the water will have a(n) \_\_\_\_\_ pH due to the reaction \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291914>

### Question 2255

Metals that do not dissolve in non-oxidizing acids are found at the \_\_\_\_\_ of the activity series.

Answer: <https://biology-forums.com/index.php?topic=289357>

### Question 2256

What is the general valence-electron ground-state electron configuration for neutral halogens?

- A) ns1
- B) ns2np7
- C) 1s22s22p7
- D) 1s22s23p7

Answer: <https://biology-forums.com/index.php?topic=289404>

### Question 2257

An acidic solution at 25°C will have a hydronium ion concentration \_\_\_\_\_ and a pH value \_\_\_\_\_.

- A)  $[H_3O^+] > 1 \times 10^{-7} \text{ M}$ , pH > 7.00
- B)  $[H_3O^+] > 1 \times 10^{-7} \text{ M}$ , pH < 7.00
- C)  $[H_3O^+] < 1 \times 10^{-7} \text{ M}$ , pH > 7.00
- D)  $[H_3O^+] < 1 \times 10^{-7} \text{ M}$ , pH < 7.00

Answer: <https://biology-forums.com/index.php?topic=290657>

### Question 2258

A galvanic cell consists of a  $Al^{3+}/Al$  half-cell and a standard hydrogen electrode. If the  $Al^{3+}/Al$  half-cell standard cell functions as the anode, and the standard cell potential is 1.66 V, what is the standard reduction potential for the  $Al^{3+}/Al$  half-cell?

- A) -1.66 V
- B) -0.55 V
- C) +0.55 V
- D) +1.66 V

Answer: <https://biology-forums.com/index.php?topic=291219>

### Question 2259

One gram is approximately the same as half the mass of a new U.S.

- A) penny.
- B) dime.
- C) quarter.
- D) dollar.

Answer: <https://biology-forums.com/index.php?topic=288741>

### Question 2260

How many lone pairs of electrons are on the Xe atom in  $XeF_6$ ?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289640>

### Question 2261

What is the volume of 10.0 g of oxygen gas at 157°C and 2.50 kPa pressure?

- A) 51.5 L
- B) 163 L
- C) 1.61 L
- D) 447 L

Answer: <https://biology-forums.com/index.php?topic=289942>

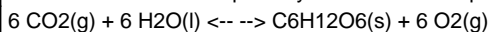
### Question 2262

Because nanoparticles have a larger percentage of atoms on the surface of the nanoparticle than on the surface of bulk material, nanoparticles have \_\_\_\_\_ melting points and \_\_\_\_\_ chemical reactivity than the bulk material.

Answer: <https://biology-forums.com/index.php?topic=291707>

### Question 2263

The overall reaction for photosynthesis can be represented by the following equation:



The enthalpy change for this reaction is 2802 kJ. Which of the following changes in condition will shift the equilibrium to the right?

- A) increase the pressure of O<sub>2</sub>
- B) increase the temperature
- C) add water
- D) add C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>(s)

Answer: <https://biology-forums.com/index.php?topic=290596>

### Question 2264

Which has the highest entropy in each set?

- I. H<sub>2</sub>O(s), H<sub>2</sub>O(l), H<sub>2</sub>O(g) at 0.1°C, 4.40 atm
- II. H<sub>2</sub>O(l) at 0°C, H<sub>2</sub>O(l) at 23°C, H<sub>2</sub>O(l) at 100°C (all at 1.0 atm pressure)

- A) H<sub>2</sub>O(l) in set I and H<sub>2</sub>O(l) at 0°C in set II
- B) H<sub>2</sub>O(s) in set I and H<sub>2</sub>O(l) at 100°C in set II
- C) H<sub>2</sub>O(g) in set I and H<sub>2</sub>O(l) at 0°C in set II
- D) H<sub>2</sub>O(g) in set I and H<sub>2</sub>O(l) at 100°C in set II

Answer: <https://biology-forums.com/index.php?topic=291032>

### Question 2265

What metal is isolated from the ore galena?

- A) lead
- B) iron
- C) zinc
- D) silver

Answer: <https://biology-forums.com/index.php?topic=291659>

### Question 2266

A KCl solution is prepared by dissolving 25.0 g KCl in 250.0 g of water at 25°C. What is the vapor pressure of the solution if the vapor pressure of water at 25°C is 23.76 mm Hg?

- A) 21.6 mm Hg
- B) 22.7 mm Hg
- C) 23.2 mm Hg
- D) 24.9 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290308>

### Question 2267

Which of the following is the lowest temperature?

- A) 35°C
- B) 57°F
- C) 313 K
- D) All of these temperatures are all equal.

Answer: <https://biology-forums.com/index.php?topic=288807>

### Question 2268

For the galvanic cell shown above, in what direction should the anions and cations in half-cell A move?

- A) The anions tend to move to the solid electrode and the cations into the salt bridge.
- B) The anions tend to move into the salt bridge and the cations toward the solid electrode.
- C) The anions tend to move toward the solid electrode and the cations should not move.
- D) The cations tend to move toward the solid electrode and the anions should not move.

Answer: <https://biology-forums.com/index.php?topic=291176>

### Question 2269

When cubic unit cells stack together, how many unit cells share a common corner?

- A) 2
- B) 4
- C) 6
- D) 8

Answer: <https://biology-forums.com/index.php?topic=290101>

### Question 2270

During perspiration,

- A) the entropy of the water evaporated decreases and the entropy of the body decreases.
- B) the entropy of the water evaporated decreases and the entropy of the body increases.
- C) the entropy of the water evaporated increases and the entropy of the body decreases.
- D) the entropy of the water evaporated increases and the entropy of the body increases.

Answer: <https://biology-forums.com/index.php?topic=290984>

### Question 2271

What is the edge length of a face-centered cubic unit cell made up of atoms having a radius of 200 pm?

- A) 71 pm
- B) 566 pm
- C) 20 pm
- D) 110 pm

Answer: <https://biology-forums.com/index.php?topic=290105>

### Question 2272

How would one classify a germanium crystal doped with arsenic?

- A) conductor
- B) n-type semiconductor
- C) p-type semiconductor
- D) insulator

Answer: <https://biology-forums.com/index.php?topic=291629>

### Question 2273

Which metal sulfides can be precipitated from a solution that is 0.01 M in  $Mn^{2+}$ ,  $Zn^{2+}$ ,  $Pb^{2+}$  and  $Cu^{2+}$  and 0.10 M in  $H_2S$  at a pH of 0.50?

- A)  $MnS$
- B)  $CuS$
- C)  $PbS$ ,  $CuS$
- D)  $ZnS$ ,  $PbS$ ,  $CuS$

Answer: <https://biology-forums.com/index.php?topic=290881>

### Question 2274

A gas absorbs 0.0 J of heat and then performs 13.1 J of work. The change in internal energy of the gas is

- A) 26.2 J
- B) 13.1 J
- C) -26.2 J
- D) -13.1 J

Answer: <https://biology-forums.com/index.php?topic=289853>

### Question 2275

What hybrid orbitals are used by carbon to form covalent bonds with hydrogen?

- A) sp
- B)  $sp^2$
- C)  $sp^3$
- D)  $sp^3d$

Answer: <https://biology-forums.com/index.php?topic=291983>

### Question 2276

In which compound is nitrogen in its highest possible oxidation state?

- A)  $NH_3$
- B)  $N_2H_4$
- C)  $HNO_2$
- D)  $HNO_3$

Answer: <https://biology-forums.com/index.php?topic=291783>

### Question 2277

What is the geometric structure of P<sub>4</sub> molecules?

- A) linear
- B) rectangular
- C) square planar
- D) tetrahedral

Answer: <https://biology-forums.com/index.php?topic=291854>

### Question 2278

As one traverses the periodic table from left to right, the effective nuclear charge Z<sub>eff</sub> increases. As a result of this the periodic properties of

- A) atomic size increases, IE increases, EA increases and electronegativity increases.
- B) atomic size decreases, IE increases, EA increases and electronegativity increases.
- C) atomic size decreases, IE decreases, EA increases and electronegativity increases.
- D) atomic size decreases, IE increases, EA decreases and electronegativity increases.

Answer: <https://biology-forums.com/index.php?topic=291709>

### Question 2279

A 5.00-L flask contains nitrogen gas at 25°C and 1.00 atm pressure. What is the final pressure in the flask if an additional 2.00 g of N<sub>2</sub> gas is added to the flask and the flask cooled to -55°C?

- A) 0.255 atm
- B) 0.987 atm
- C) 1.35 atm
- D) 1.84 atm

Answer: <https://biology-forums.com/index.php?topic=290003>

### Question 2280

When baking soda is heated it decomposes according to the following reaction:



If sufficient baking soda is placed in a container and heated to 90°C, the total pressure of the gases is 0.5451 atm. What is the value of K<sub>p</sub> at that temperature?

- A) 0.07428
- B) 0.2973
- C) 0.4228
- D) 1.091

Answer: <https://biology-forums.com/index.php?topic=290543>

### Question 2281

Which of the noble gases should show the greatest deviation from the ideal gas law at high pressures?

- A) He
- B) Ar
- C) Rn
- D) All deviate equally.

Answer: <https://biology-forums.com/index.php?topic=289977>

### Question 2282

What is the molecular geometry of CH<sub>3</sub>-?

- A) T-shaped
- B) tetrahedral
- C) trigonal planar
- D) trigonal pyramidal

Answer: <https://biology-forums.com/index.php?topic=289663>

### Question 2283

Which has been found to be a three dimensional superconductor that conducts equally in all directions?

- A) C (diamond)
- B) C (graphite)
- C) K<sub>3</sub>C<sub>60</sub>
- D) YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>

Answer: <https://biology-forums.com/index.php?topic=291644>

### Question 2284

What is an example of the proper number of bonds to carbon?

- A) two double bonds
- B) one double bond + one triple bond
- C) three single bonds
- D) five single bonds

Answer: <https://biology-forums.com/index.php?topic=291986>

### Question 2285

In addition to an amine, which functional group do all amino acids contain?

- A) an alcohol
- B) an amide
- C) a carboxylic acid
- D) an oxyacid

Answer: <https://biology-forums.com/index.php?topic=291969>

### Question 2286

What is the pH of a solution made by mixing 20.00 mL of 0.100 M HCl with 40.00 mL of 0.100 M KOH? Assume that the volumes of the solutions are additive.

- A) 0.48
- B) 1.48
- C) 12.52
- D) 13.52

Answer: <https://biology-forums.com/index.php?topic=290905>

### Question 2287

The secondary pollutants in photochemical smog are \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290072>

### Question 2288

What is the molecular geometry of  $\text{TeF}_5^-$ ?

- A) octahedral
- B) seesaw
- C) square pyramidal
- D) trigonal bipyramidal

Answer: <https://biology-forums.com/index.php?topic=289665>

### Question 2289

Four heavy elements (A, B, C, and D) will fission when bombarded by neutrons. In addition to fissioning into two smaller elements, A also gives off a beta particle, B gives off gamma rays, C gives off neutrons, and D gives off alpha particles. Which element would make a possible fuel for a nuclear reactor?

- A) element A
- B) element B
- C) element C
- D) element D

Answer: <https://biology-forums.com/index.php?topic=291381>

### Question 2290

A fishing boat accidentally spills 15 barrels of diesel oil into the ocean. Each barrel contains 42 gallons. If the oil film on the ocean is  $2.5 \times 10^2$  nm thick, how many square meters will the oil slick cover?

- A)  $9.5 \times 10^{-3}$  m<sup>2</sup>
- B)  $9.5 \times 10^6$  m<sup>2</sup>
- C)  $9.5 \times 10^7$  m<sup>2</sup>
- D) none of these

Answer: <https://biology-forums.com/index.php?topic=288771>

### Question 2291

The energy of motion is



- A) electrical energy.
- B) dam energy.
- C) reserve energy.
- D) kinetic energy.

Answer: <https://biology-forums.com/index.php?topic=289844>

### Question 2292

The dipole moment of ClF is 0.88 D, and its bond length is 163 pm. What is the percent ionic character of the Cl—F bond?

- A) 0.54%
- B) 7.8%
- C) 11%
- D) 25%

Answer: <https://biology-forums.com/index.php?topic=289682>

### Question 2293

Mg can react with HCl to produce the white solid MgCl<sub>2</sub> and H<sub>2</sub> gas. A student mixes 1.99 g of Mg with 5.98 g of HCl. If the mass of the white solid is 7.79 g, then what is the mass of H<sub>2</sub> produced?

- A) 0.0 g
- B) 0.18 g
- C) 2.0 g
- D) 15.76 g

Answer: <https://biology-forums.com/index.php?topic=288969>

### Question 2294

What is the pH of the resulting solution if 30.00 mL of 0.10 M acetic acid is added to 10.00 mL of 0.10 M NaOH? Assume that the volumes of the solutions are additive.  $K_a = 1.8 \times 10^{-5}$  for CH<sub>3</sub>CO<sub>2</sub>H.

- A) 9.56
- B) 8.95
- C) 5.05
- D) 4.44

Answer: <https://biology-forums.com/index.php?topic=290857>

### Question 2295

What is the highest possible oxidation state for chromium?

- A) +2
- B) +4
- C) +7
- D) +6

Answer: <https://biology-forums.com/index.php?topic=291561>

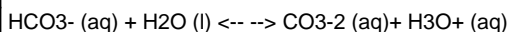
### Question 2296

An AlGaAs diode laser pointer emits 532 nm light and appears \_\_\_\_\_ (blue, green, red) in color.

Answer: <https://biology-forums.com/index.php?topic=291700>

### Question 2297

Consider the reaction



The  $K_{eq}$  for this reaction is  $5.6 \times 10^{-11}$ . Describe what will happen to the reaction if the concentration of each reactant is

$$[\text{HCO}_3^-] = 5.6 \times 10^{-11} \quad [\text{H}_3\text{O}^+] = 1.2 \times 10^{-11} \quad [\text{CO}_3^{2-}] = 5.6 \times 10^{-11}$$

- A) Reaction will shift right, concentration of products will increase.
- B) Reaction will shift left, concentration of reactants will increase.
- C) Reaction will not change, it is at equilibrium.
- D) Not enough information to determine the answer.

Answer: <https://biology-forums.com/index.php?topic=290550>

### Question 2298

Which of the following forms an ionic solid?

- A) Au
- B) CH<sub>3</sub>NH<sub>2</sub>
- C) NH<sub>4</sub>Cl

D) N H<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290147>

### Question 2299

What statement is most inconsistent about the chemistry of iron?

- A) Iron(III) hydroxide is very soluble and reacts readily with hydroxide to form Fe(OH)<sub>4</sub><sup>-</sup>.
- B) Iron reacts with hydrochloric acid in the absence of air to yield iron(II) ion and hydrogen gas.
- C) Iron reacts with nitric acid to yield iron(III) ion and nitric oxide.
- D) The most common oxidation states of iron are +2 (ferrous) and +3 (ferric).

Answer: <https://biology-forums.com/index.php?topic=291502>

### Question 2300

The term "carbohydrates" refers to a large class of polyhydroxylated

- A) alcohols and carboxylic acids.
- B) aldehydes and ketones.
- C) amines and amides.
- D) ethers and esters.

Answer: <https://biology-forums.com/index.php?topic=291949>

### Question 2301

Which is not a spontaneous process?

- A) combustion of gasoline to produce carbon dioxide and water
- B) diffusion of perfume in a room
- C) dissolution of powdered punch in water
- D) freezing of water at 3°C

Answer: <https://biology-forums.com/index.php?topic=289882>

### Question 2302

Most of the radiation to which people are exposed comes from

- A) atmospheric testing of nuclear weapons.
- B) emissions from nuclear power plants.
- C) medical procedures.
- D) natural sources.

Answer: <https://biology-forums.com/index.php?topic=291409>

### Question 2303

In the process of dissolving ionic compounds, the cations and anions are separated from the crystal lattice and surrounded by an ordered shell of solvent molecules. If the solvent is water, the dissolved ions are said to be

- A) ionized.
- B) homogenized.
- C) hybridized.
- D) hydrated.

Answer: <https://biology-forums.com/index.php?topic=290271>

### Question 2304

In the electron dot structure of HCN, the bond order of CN is

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289613>

### Question 2305

All reactions in the human body are catalyzed by

- A) carboxylic acids.
- B) alcohols.
- C) proteins.
- D) alkanes.

Answer: <https://biology-forums.com/index.php?topic=292025>

### Question 2306

What mass of ammonia,  $\text{NH}_3$ , contains the same number of molecules as 3.00 g of trichlorofluoromethane,  $\text{CCl}_3\text{F}$ ?

- A) 0.0412 g
- B) 0.371 g
- C) 2.69 g
- D) 24.2 g

Answer: <https://biology-forums.com/index.php?topic=289138>

### Question 2307

What ion is provided when Arrhenius bases dissolve in water?

- A)  $\text{H}^+$
- B)  $\text{Na}^+$
- C)  $\text{Cl}^-$
- D)  $\text{OH}^-$

Answer: <https://biology-forums.com/index.php?topic=289226>

### Question 2308

The reaction for the decomposition of dinitrogen monoxide gas to form oxygen radicals is: . If the rate constant is  $3.04 \times 10^{-2} \text{ s}^{-1}$  and the frequency factor is  $8.00 \times 10^{11} \text{ s}^{-1}$ , what is the activation energy for the first-order reaction at  $700^\circ\text{C}$ ?

- A) 0.262 kJ/mol
- B) 38.2 kJ/mol
- C) 180 kJ/mol
- D) 250 kJ/mol

Answer: <https://biology-forums.com/index.php?topic=290397>

### Question 2309

Which of the following bonds is expected to be stronger?

- A) C—C bond with a bond order of 0
- B) C—C bond with a bond order of 1
- C) C—C bond with a bond order of 2
- D) C—C bond with a bond order of 3

Answer: <https://biology-forums.com/index.php?topic=289588>

### Question 2310

Cubic closest-packing

- A) has a body-centered cubic unit cell.
- B) has a face-centered cubic unit cell.
- C) has a simple cubic unit cell.
- D) has the same unit cell as hexagonal closest-packing.

Answer: <https://biology-forums.com/index.php?topic=290111>

### Question 2311

Which element can accommodate more than eight electrons in its valence shell?

- A) N
- B) O
- C) Ga
- D) Ne

Answer: <https://biology-forums.com/index.php?topic=289637>

### Question 2312

Which ion has the smallest ionic radius?

- A)  $\text{Li}^+$
- B)  $\text{Na}^+$
- C)  $\text{K}^+$
- D)  $\text{Rb}^+$

Answer: <https://biology-forums.com/index.php?topic=289478>

### Question 2313

The lowest atmospheric temperatures are found at the

- A) earths surface.
- B) troposphere/stratosphere junction.
- C) stratosphere/mesosphere junction.
- D) mesosphere/thermosphere junction.

Answer: <https://biology-forums.com/index.php?topic=289980>

### Question 2314

If NO<sub>2</sub> and NH<sub>3</sub> are allowed to effuse through a porous membrane under identical conditions, the rate of effusion for NH<sub>3</sub> will be \_\_\_\_\_ times that of CO<sub>2</sub>.

- A) 0.37
- B) 0.61
- C) 1.6
- D) 2.7

Answer: <https://biology-forums.com/index.php?topic=290039>

### Question 2315

What is the most likely charge on an ion of phosphorus, P?

- A) 5-
- B) 3-
- C) 1+
- D) 5+

Answer: <https://biology-forums.com/index.php?topic=289022>

### Question 2316

How many atoms are in one face-centered cubic unit cell of a metal?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=290099>

### Question 2317

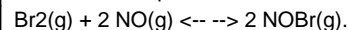
A constant current is passed through a solution containing Cu<sup>2+</sup>(aq) resulting in the deposition of 4.40 g of Cu at the cathode. Assuming a current efficiency of 100%, if this same current is passed through a solution of TcO<sub>4</sub><sup>-</sup> for the same amount of time, how many grams of Tc would form at the cathode?

- A) 0.969 g
- B) 1.94 g
- C) 6.78 g
- D) 13.6 g

Answer: <https://biology-forums.com/index.php?topic=291174>

### Question 2318

At a certain temperature, bromine and nitric oxide react to form nitrosyl bromide:



When initial amounts of Br<sub>2</sub>, NO, and NOBr are mixed, the concentration of NOBr increases. Which statement below is true?

- A) K<sub>c</sub> < Q
- B) K<sub>c</sub> > Q
- C) K<sub>c</sub> = Q
- D) More information is needed to make a statement about K<sub>c</sub>.

Answer: <https://biology-forums.com/index.php?topic=290522>

### Question 2319

What is a principal commercial ore for the element iron?

- A) bauxite
- B) pyrolusite
- C) ilmenite
- D) hematite

Answer: <https://biology-forums.com/index.php?topic=291657>

### Question 2320

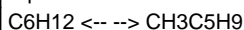
The chemical formula for the carbonate ion is

- A) C<sup>-</sup>.
- B) CO<sup>-</sup>.
- C) CO<sub>3</sub><sup>2-</sup>.
- D) CO<sub>2</sub><sup>-</sup>.

Answer: <https://biology-forums.com/index.php?topic=289033>

### Question 2321

Cyclohexane, C<sub>6</sub>H<sub>12</sub>, undergoes a molecular rearrangement in the presence of AlCl<sub>3</sub> to form methylcyclopentane, CH<sub>3</sub>C<sub>5</sub>H<sub>9</sub>, according to the equation:



If  $K_c = 0.143$  at 25°C for this reaction, find the equilibrium concentrations of C<sub>6</sub>H<sub>12</sub> and CH<sub>3</sub>C<sub>5</sub>H<sub>9</sub> if the initial concentrations are 0.200 M and 0.200 M, respectively.

- A) [C<sub>6</sub>H<sub>12</sub>] = 0.150 M, [CH<sub>3</sub>C<sub>5</sub>H<sub>9</sub>] = 0.150 M
- B) [C<sub>6</sub>H<sub>12</sub>] = 0.050 M, [CH<sub>3</sub>C<sub>5</sub>H<sub>9</sub>] = 0.162 M
- C) [C<sub>6</sub>H<sub>12</sub>] = 0.350 M, [CH<sub>3</sub>C<sub>5</sub>H<sub>9</sub>] = 0.050 M
- D) [C<sub>6</sub>H<sub>12</sub>] = 0.396 M, [CH<sub>3</sub>C<sub>5</sub>H<sub>9</sub>] = 0.004 M

Answer: <https://biology-forums.com/index.php?topic=290580>

### Question 2322

When an electron is added to the lowest unoccupied molecular orbital of N<sub>2</sub>, the electron is added to a(n) \_\_\_\_\_ (antibonding, bonding) molecular orbital and the N—N bond order will \_\_\_\_\_ (decrease, increase).

Answer: <https://biology-forums.com/index.php?topic=289773>

### Question 2323

Under which of the following conditions would one mole of Kr have the highest entropy, S?

- A) 47°C and 45 L
- B) 157°C and 45 L
- C) 47°C and 55 L
- D) 157°C and 55 L

Answer: <https://biology-forums.com/index.php?topic=291030>

### Question 2324

The compound, Cu(I O<sub>3</sub>)<sub>2</sub>, is named

- A) copper iodate(II).
- B) copper(I) iodate.
- C) copper(I) iodate(II).
- D) copper(II) iodate.

Answer: <https://biology-forums.com/index.php?topic=289016>

### Question 2325

If an equal number of moles of the weak acid HCN and the strong base KOH are added to water, is the resulting solution acidic, basic, or neutral?

- A) acidic
- B) basic
- C) neutral
- D) There is insufficient information provided to answer this question.

Answer: <https://biology-forums.com/index.php?topic=290713>

### Question 2326

In the shorthand notation for a galvanic cell, a single vertical line (|) represents a \_\_\_\_\_, and a double vertical line (||) represents a \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291273>

### Question 2327

Of Na<sub>2</sub>O, SO<sub>2</sub>, and SO<sub>3</sub>, equimolar aqueous solutions of \_\_\_\_\_ would be most acidic and of \_\_\_\_\_ would be most basic.

Answer: <https://biology-forums.com/index.php?topic=291928>

### Question 2328

A diode has a negative bias when the p-type semiconductor is attached to the \_\_\_\_\_ (negative, positive) battery terminal, which \_\_\_\_\_ (inhibits, permits) electron flow.

Answer: <https://biology-forums.com/index.php?topic=291697>

### Question 2329

Which is expected to have the largest dispersion forces?

- A) C<sub>2</sub>H<sub>4</sub>
- B) C<sub>18</sub>H<sub>36</sub>
- C) NBr<sub>3</sub>
- D) Ba

Answer: <https://biology-forums.com/index.php?topic=289747>

### Question 2330

Combustion analysis of an unknown compound containing only carbon and hydrogen produced 1.1385 g of CO<sub>2</sub> and 0.5805 g of H<sub>2</sub>O. What is the empirical formula of the compound?

- A) CH<sub>2</sub>
- B) C<sub>2</sub>H<sub>5</sub>
- C) C<sub>4</sub>H<sub>10</sub>
- D) C<sub>5</sub>H<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=289184>

### Question 2331

Which one of the following salts, when dissolved in water, produces the solution with the highest pH?

- A) NaI
- B) KBr
- C) RbCl
- D) CsF

Answer: <https://biology-forums.com/index.php?topic=290788>

### Question 2332

What is the molecular structure of phosphorous acid?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=291797>

### Question 2333

Which of the following atoms is expected to be sp<sup>2</sup> hybridized?

- A) C in C<sub>2</sub>H<sub>6</sub>
- B) C-H in C<sub>3</sub>H<sub>4</sub>
- C) O in CH<sub>3</sub>CH<sub>2</sub>OH
- D) O in CHO

Answer: <https://biology-forums.com/index.php?topic=292019>

### Question 2334

For transition elements, which of the following occurs as the effective nuclear charge increases?

- A) The atomic radius increases.
- B) The density increases.
- C) Both the atomic radius and the density increase.
- D) The atomic radius decreases and the density increases.

Answer: <https://biology-forums.com/index.php?topic=291487>

### Question 2335

HBr, HCl, HClO<sub>4</sub>, KBr, and NaCl are all classified as

- A) acids.
- B) nonelectrolytes.
- C) strong electrolytes.
- D) weak electrolytes.

Answer: <https://biology-forums.com/index.php?topic=289292>

### Question 2336

How many carbon-carbon bonds are present in C<sub>3</sub>H<sub>8</sub>?

- A) 3
- B) 1
- C) 2
- D) 0

Answer: <https://biology-forums.com/index.php?topic=289642>

### Question 2337

Which of the following solutions will have the lowest freezing point?

- A) 0.010 m Rb I
- B) 0.010 m K<sub>2</sub>SeO<sub>4</sub>
- C) 0.035 m CH<sub>3</sub>OH
- D) 0.015 m SrBr<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=290311>

### Question 2338

A bottle of pure element was missing part of a label. The label said  $2.258 \times 10^{23}$  atoms. You determine the mass of the elements in the bottle to be 10.51946. What is the identity of this element?

- A) B
- B) N
- C) Si
- D) Sr

Answer: <https://biology-forums.com/index.php?topic=288980>

### Question 2339

Naproxen is a commercially important anti-inflammatory agent that can be isolated from the thyroid gland. A solution of 1.138 g of naproxen in 25.00 g benzene has an osmotic pressure of 4.00 atm at 20°C. The density of benzene is 0.8787 g/mL at this temperature. Calculate the molar mass of naproxen, assuming it remains intact upon dissolution and the density of the solution equals the density of pure benzene.

- A) 176 g/mol
- B) 230 g/mol
- C) 307 g/mol
- D)  $3.80 \times 10^5$  g/mol

Answer: <https://biology-forums.com/index.php?topic=290262>

### Question 2340

Ethyl chloride, C<sub>2</sub>H<sub>5</sub>Cl, is used as a local anesthetic. It works by cooling tissue as it vaporizes. The heat of vaporization is 26.4 kJ/mol. How much heat could be removed by 60.0 g of ethyl chloride?

- A) 24.6 kJ
- B) 1584 kJ
- C) 2.28 kJ
- D) 1703 kJ

Answer: <https://biology-forums.com/index.php?topic=290079>

### Question 2341

Specific gravity of a liquid is often defined as the ratio of the density of a substance to the density of water. If the specific gravity of X relative to water is 0.800 and the specific gravity of Y relative to water is 1.50, which of the following statements is false?

- A) If X is a liquid, Y will float on X.
- B) If X is a solid, X will float in water.
- C) If Y is a liquid, water will float on Y.
- D) If Y is a liquid, X will float in Y.

Answer: <https://biology-forums.com/index.php?topic=288763>

### Question 2342

Which of the following compounds has the highest boiling point?

- A) H<sub>2</sub>O
- B) H<sub>2</sub>S
- C) H<sub>2</sub>Se
- D) H<sub>2</sub>Te

Answer: <https://biology-forums.com/index.php?topic=289750>

### Question 2343

The chlor-alkali industry is based on the electrolysis of aqueous NaCl. What are the products of this electrolysis?

- A) Na and Cl<sub>2</sub>
- B) NaOH, H<sub>2</sub>, and O<sub>2</sub>
- C) NaOH, H<sub>2</sub>, and Cl<sub>2</sub>
- D) NaOH, O<sub>2</sub>, and Cl<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=291163>

### Question 2344

10% saline solution (sodium chloride dissolved in water) is an example of a \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289059>

### Question 2345

How many unit cells share an atom that is on the face of a face-centered cubic unit cell?

- A) 1
- B) 2
- C) 4
- D) 8

Answer: <https://biology-forums.com/index.php?topic=290102>

### Question 2346

What is the mass of a single astatine molecule, At<sub>2</sub>?

- A)  $3.49 \times 10^{-22}$  g
- B)  $6.97 \times 10^{-22}$  g
- C) 210 g
- D) 420 g

Answer: <https://biology-forums.com/index.php?topic=289130>

### Question 2347

What is the number of moles of  $5.00 \times 10^{22}$  molecules of NaBr?

- A) 0.037 moles
- B) 1.0 moles
- C) 0.083 moles
- D) 1.2046 moles

Answer: <https://biology-forums.com/index.php?topic=289159>

### Question 2348

How many molecules of N<sub>2</sub> are in a 300.0 mL container at 780 mm Hg and 135°C?

- A)  $5.26 \times 10^{21}$  molecules
- B)  $5.54 \times 10^{21}$  molecules
- C)  $1.59 \times 10^{22}$  molecules
- D)  $1.67 \times 10^{22}$  molecules

Answer: <https://biology-forums.com/index.php?topic=290000>

### Question 2349

What is the pH of a solution prepared by mixing 25.00 mL of 0.10 M CH<sub>3</sub>CO<sub>2</sub>H with 25.00 mL of 0.050 M CH<sub>3</sub>CO<sub>2</sub>Na? Assume that the volume of the solutions are additive and that  $K_a = 1.8 \times 10^{-5}$  for CH<sub>3</sub>CO<sub>2</sub>H.

- A) 2.87
- B) 4.44
- C) 4.74
- D) 5.05

Answer: <https://biology-forums.com/index.php?topic=290829>

### Question 2350

Sodium metal and water react to form hydrogen and sodium hydroxide. If 5.98 g of sodium react with water to form 0.26 g of hydrogen and 10.40 g of sodium hydroxide, what mass of water was consumed in the reaction?

- A) 4.68 g



- B) 5.98 g
- C) 10.14 g
- D) 10.66 g

Answer: <https://biology-forums.com/index.php?topic=288879>

### Question 2351

Some assumptions from the kinetic molecular theory are listed below. Which one is most frequently cited to explain Charles' law?

- A) The average kinetic energy of gas particles is proportional to the Kelvin temperature.
- B) Collisions of gas particles are elastic and total kinetic energy of the gas is constant.
- C) A gas consists of tiny particles moving in random straight line motion.
- D) The volume of the particles is negligible compared to the volume of the gas.

Answer: <https://biology-forums.com/index.php?topic=289964>

### Question 2352

In order for a photovoltaic cell to convert light to electricity, the band gap must be less than or equal to the energy of the light absorbed. If light of 955 nm is to be absorbed, the band gap of the photovoltaic cell must be less than or equal to \_\_\_\_\_ kJ/mol.

Answer: <https://biology-forums.com/index.php?topic=291701>

### Question 2353

Which is the only element that contains more protons than neutrons in its most abundant stable isotope?

- A) lithium
- B) nitrogen
- C) hydrogen
- D) copper

Answer: <https://biology-forums.com/index.php?topic=291433>

### Question 2354

Which concentration becomes smaller as the temperature is increased from 25°C to 60°C?

- A) mass %
- B) molality
- C) molarity
- D) mole fraction

Answer: <https://biology-forums.com/index.php?topic=290298>

### Question 2355

Which is a measure of the sum of the kinetic and potential energies of each particle in the system?

- A) E, the internal energy
- B) G, the Gibbs free energy
- C) H, the enthalpy
- D) T, the temperature

Answer: <https://biology-forums.com/index.php?topic=289777>

### Question 2356

Limnite is an ore having a formula that is sometimes written as an iron(III) oxide hydrate,  $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ . If 1.00 kg of limnite produces 0.747 kg of anhydrous  $\text{Fe}_2\text{O}_3$  upon heating, what is the number of waters of hydration  $x$  in the  $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ ?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: <https://biology-forums.com/index.php?topic=291599>

### Question 2357

Dinitrogen monoxide gas decomposes to form nitrogen gas and oxygen gas. How many grams of oxygen are formed when 20.0 g of dinitrogen monoxide decomposes?

- A) 0.138 g
- B) 7.27 g
- C) 14.5 g
- D) 29.1 g

Answer: <https://biology-forums.com/index.php?topic=289152>

### Question 2358

Hydrochloric acid in the hydrolysis of an ester to form an alcohol and a carboxylic acid is an example of a \_\_\_\_\_ (heterogeneous, homogeneous) catalyst.

Answer: <https://biology-forums.com/index.php?topic=290482>

### Question 2359

How many lone pairs of electrons are on the I atom in IF<sub>5</sub>?

- A) 0
- B) 1
- C) 2
- D) 3

Answer: <https://biology-forums.com/index.php?topic=289611>

### Question 2360

Consider the following electron configurations for neutral atoms:

atom I = 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>

atom II = 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>3p<sup>4</sup>

atom III = 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>3p<sup>6</sup>

Which atom would be expected to have the largest third ionization energy?

- A) atom I
- B) atom II
- C) atom III
- D) All of these atoms would be expected to have the same third ionization energy.

Answer: <https://biology-forums.com/index.php?topic=289496>

### Question 2361

Identify and give the sign of each electrode.

- A) a is Ag and (+), c is Cu and (-).
- B) a is Ag and (-), c is Cu and (+).
- C) a is Cu and (+), c is Ag and (-).
- D) a is Cu and (-), c is Ag and (+).

Answer: <https://biology-forums.com/index.php?topic=291179>

### Question 2362

Which of the following notations represents the dipeptide shown below?

- A) Phe-Thr
- B) Thr-Phe
- C) Ser-Tyr
- D) Tyr-Ser

Answer: <https://biology-forums.com/index.php?topic=291981>

### Question 2363

Which is an amino acid nonpolar neutral side chain?

- A) -CH<sub>3</sub>
- B) -CH<sub>2</sub>OH
- C) -CH<sub>2</sub>CO<sub>2</sub>H
- D) -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>

Answer: <https://biology-forums.com/index.php?topic=291972>

### Question 2364

If the ionization constant of water, K<sub>w</sub>, at 40°C is 2.92 × 10<sup>-14</sup>, then what is the hydronium ion concentration and pH for an acidic solution?

- A) [H<sub>3</sub>O<sup>+</sup>] > 1.71 × 10<sup>-7</sup> M and pH > 6.77
- B) [H<sub>3</sub>O<sup>+</sup>] > 1.71 × 10<sup>-7</sup> M and pH < 6.77
- C) [H<sub>3</sub>O<sup>+</sup>] < 1.71 × 10<sup>-7</sup> M and pH > 6.77
- D) [H<sub>3</sub>O<sup>+</sup>] < 1.71 × 10<sup>-7</sup> M and pH < 6.77

Answer: <https://biology-forums.com/index.php?topic=290658>

### Question 2365

At the normal body temperature of 37°C,  $K_w = 2.42 \times 10^{-14}$ . The  $H_3O^+$  concentration of normal blood ranges from  $3.5 \times 10^{-8}$  to  $4.5 \times 10^{-8}$ . The  $OH^-$  concentration of normal blood ranges from \_\_\_\_\_ to \_\_\_\_\_, and blood is \_\_\_\_\_ (acidic, basic, neutral).

Answer: <https://biology-forums.com/index.php?topic=290808>

### Question 2366

Which metal ions can be precipitated out of solution as chlorides?

- A)  $Ag^+$ ,  $Hg^{2+}$ ,  $Zn^{2+}$
- B)  $Cu^{2+}$ ,  $Cd^{2+}$ ,  $Bi^{3+}$
- C)  $Ag^+$ ,  $Hg^{2+}$ ,  $Pb^{2+}$
- D)  $Na^+$ ,  $Li^+$ ,  $Ca^{2+}$

Answer: <https://biology-forums.com/index.php?topic=290929>

### Question 2367

What is the pH of a solution prepared by mixing 100.00 mL of 0.20 M HCl with 50.00 mL of 0.30 M HCl? Assume that the volumes are additive.

- A) 0.25
- B) 0.30
- C) 0.63
- D) 1.70

Answer: <https://biology-forums.com/index.php?topic=290767>

### Question 2368

Which metal sulfides can be precipitated from a solution that is 0.01 M in  $Mn^{2+}$ ,  $Zn^{2+}$ ,  $Pb^{2+}$  and  $Cu^{2+}$  and 0.10 M in  $H_2S$  at a pH of 1.0?

- A)  $MnS$
- B)  $CuS$
- C)  $PbS$ ,  $CuS$
- D)  $ZnS$ ,  $PbS$ ,  $CuS$

Answer: <https://biology-forums.com/index.php?topic=290880>

### Question 2369

$^{201}Tl$  is used in myocardial perfusion imaging. It undergoes beta decay with a half-life of 73 hours generating 80 keV X-rays. A typical dose is 2.5 mCi which is equal to \_\_\_\_\_ Bq.

Answer: <https://biology-forums.com/index.php?topic=291479>

### Question 2370

For the isomerization reaction:

butane  $\leftrightarrow$  isobutane

$K_p$  equals 25 at 500°C. If the initial pressures of butane and isobutane are 10. atm and 0.0 atm, respectively, what are the pressures of the two gases at equilibrium?

- A)  $P(\text{butane}) = 0.38$  atm and  $P(\text{isobutane}) = 9.6$  atm
- B)  $P(\text{butane}) = 0.40$  atm and  $P(\text{isobutane}) = 10.$  atm
- C)  $P(\text{butane}) = 9.6$  atm and  $P(\text{isobutane}) = 0.38$  atm
- D)  $P(\text{butane}) = 10$  atm and  $P(\text{isobutane}) = 0.40$  atm

Answer: <https://biology-forums.com/index.php?topic=290526>

### Question 2371

The sum of the masses of the protons and neutrons in a given nucleus minus the mass of that nucleus is always

- A) negative.
- B) positive.
- C) temperature dependent.
- D) zero.

Answer: <https://biology-forums.com/index.php?topic=291365>

### Question 2372

The hydrogen ion,  $H^+$ , is also referred to as a \_\_\_\_\_, and a hydrated hydrogen ion,  $H_3O^+$ , is called a \_\_\_\_\_ ion.

Answer: <https://biology-forums.com/index.php?topic=289348>

### Question 2373

The number of orbitals in the  $n = 3$  shell is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289463>

### Question 2374

Which orbitals have two nodal planes passing through the nucleus?

- A) s
- B) p
- C) d
- D) all in the third shell

Answer: <https://biology-forums.com/index.php?topic=289393>

### Question 2375

How many electrons are in the valence shell of I in  $IF_4^-$ ?

- A) 8
- B) 10
- C) 12
- D) 14

Answer: <https://biology-forums.com/index.php?topic=289612>

### Question 2376

Which of the following does not have the same number of valence electrons?

- A) O
- B) S
- C) Ca
- D) Po

Answer: <https://biology-forums.com/index.php?topic=289437>

### Question 2377

What is the overall reaction order for the reaction that has the rate law:  $\text{Rate} = k[H_2][NO]^2$ ?

- A) zero order
- B) first order
- C) second order
- D) third order

Answer: <https://biology-forums.com/index.php?topic=290363>

### Question 2378

As the atomic number of the elements increases, the ratio of neutrons to protons in stable nuclei

- A) decreases.
- B) stays the same.
- C) increases.
- D) is unrelated to stability.

Answer: <https://biology-forums.com/index.php?topic=291345>

### Question 2379

At what pH is the amino acid glycine with a  $K_a$  of  $2.51 \times 10^{-10}$  sixty-six (66%) percent dissociated?

- A) 9.60
- B) 9.89
- C) 10.10
- D) 10.60

Answer: <https://biology-forums.com/index.php?topic=290849>

### Question 2380

Based on formal charge considerations, the electron-dot structure of  $CO_3^{2-}$  ion has

- A) two resonance structures involving two single bonds and one double bond.
- B) two resonance structures involving one single bond and two double bonds.
- C) three resonance structures involving two single bonds and one double bond.
- D) three resonance structures involving one single bond and two double bonds.

Answer: <https://biology-forums.com/index.php?topic=289618>

### Question 2381

Fresh air contains approximately 400 ppm CO<sub>2</sub>, whereas the breath of an intoxicated person contains about 4 percent CO<sub>2</sub>. The amount of CO<sub>2</sub> in the breath of an intoxicated person is \_\_\_\_\_ times the amount of CO<sub>2</sub> in fresh air.

- A) 10-2
- B) 10-1
- C) 101
- D) 102

Answer: <https://biology-forums.com/index.php?topic=290294>

### Question 2382

Which name is not correct?

- A) 2, 2-dimethylbutane
- B) 2, 3-dimethyloctane
- C) 2, 6, 6-trimethylheptane
- D) 2, 3, 3-trimethyloctane

Answer: <https://biology-forums.com/index.php?topic=292004>

### Question 2383

Which of the following elements is classified as a semimetal?

- A) calcium
- B) silicon
- C) fluorine
- D) uranium

Answer: <https://biology-forums.com/index.php?topic=288952>

### Question 2384

O<sub>2</sub> and O<sub>3</sub> are \_\_\_\_\_ of oxygen.

- A) allotropes
- B) isomers
- C) isotopes
- D) stereomers

Answer: <https://biology-forums.com/index.php?topic=290120>

### Question 2385

The factor 10 corresponds to which prefix?

- A) centi
- B) deci
- C) deka
- D) milli

Answer: <https://biology-forums.com/index.php?topic=288785>

### Question 2386

All but one of the common amino acids contain a -NH<sub>2</sub> amino group. Which one contains an -NH- amino group as part of a ring structure?

- A) phenylalanine
- B) proline
- C) tyrosine
- D) arginine

Answer: <https://biology-forums.com/index.php?topic=292040>

### Question 2387

Which of the following is the smallest unit?

- A) 13 centi
- B) 3.0 deci
- C) 3.3 × 10<sup>3</sup> milli
- D) 1.5 × 10<sup>6</sup> nano

Answer: <https://biology-forums.com/index.php?topic=288783>

### Question 2388

Arrange the following compounds in order of their expected increasing solubility in water:

NaF, CH<sub>3</sub>CH<sub>2</sub>-O-CH<sub>2</sub>CH<sub>3</sub>, CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-OH, CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>.

- A) CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub> < NaF < CH<sub>3</sub>CH<sub>2</sub>-O-CH<sub>2</sub>CH<sub>3</sub> < CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-OH

- B)  $\text{NaCl} < \text{CH}_3\text{CH}_2\text{-O-CH}_2\text{CH}_3 < \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{-OH} < \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$   
C)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3 < \text{CH}_3\text{CH}_2\text{-O-CH}_2\text{CH}_3 < \text{NaF} < \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{-OH}$   
D)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3 < \text{CH}_3\text{CH}_2\text{-O-CH}_2\text{CH}_3 < \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{-OH} < \text{NaF}$

Answer: <https://biology-forums.com/index.php?topic=290274>

### Question 2389

What is the concentration of  $\text{FeCl}_3$  in a solution prepared by dissolving 10.0 g of  $\text{FeCl}_3$  in enough water to make 275 mL of solution?

- A)  $2.24 \times 10^{-4}$  M  
B) 0.224 M  
C) 4.46 M  
D)  $4.46 \times 10^3$  M

Answer: <https://biology-forums.com/index.php?topic=289278>

### Question 2390

How many isomers exist for  $\text{C}_5\text{H}_{12}$ ? Of these isomers, how many are straight-chain isomers and how many are branched isomers?

Answer: <https://biology-forums.com/index.php?topic=292049>

### Question 2391

How many  $\text{Fe(II)}$  ions are there in 5.00 g of  $\text{FeSO}_4$ ?

- A)  $5.46 \times 10^{-26}$  iron(II) ions  
B)  $1.98 \times 10^{22}$  iron(II) ions  
C)  $1.83 \times 10^{25}$  iron(II) ions  
D)  $4.58 \times 10^{26}$  iron(II) ions

Answer: <https://biology-forums.com/index.php?topic=289133>

### Question 2392

What is the pH of a 0.020 M  $\text{Ba(OH)}_2$  solution?

- A) 1.40  
B) 1.70  
C) 12.30  
D) 12.60

Answer: <https://biology-forums.com/index.php?topic=290672>

### Question 2393

A buffer prepared by mixing equal moles of an acid having  $K_a = 4.5 \times 10^{-4}$  and a salt of its conjugate base has a pH = \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290939>

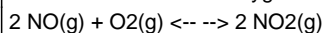
### Question 2394

The addition of \_\_\_\_\_ mL of 0.3000 M  $\text{NaOH}$  is required to titrate 60.00 mL of 0.2000 M  $\text{HCl}$  to the equivalence point, which occurs at a pH of \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290945>

### Question 2395

Nitric oxide reacts with oxygen to form nitrogen dioxide:



What is  $K_c$  for the reverse reaction if the equilibrium concentration of  $\text{NO}$  is 0.300 M,  $\text{O}_2$  is 0.200 M, and  $\text{NO}_2$  is 0.530 M at 25°C?

- A) 0.0340  
B) 0.0641  
C) 0.624  
D) 15.6

Answer: <https://biology-forums.com/index.php?topic=290490>

### Question 2396

Which of the following processes is spontaneous?

- A) a mixture of two liquids separating into pure compounds  
B) reaction of sodium with oxygen  
C) precipitation of solute from a unsaturated solution  
D) water flowing uphill

Answer: <https://biology-forums.com/index.php?topic=291021>

### Question 2397

Bromothymol blue indicator changes color from yellow at a pH of 6.0 to blue at a pH of 7.6. Phenol red indicator changes color from yellow at a pH of 6.8 to red at a pH of 8.4. A sample of pancreatic fluid having  $[\text{OH}^-] = 1.258 \times 10^{-6}$  would impart a \_\_\_\_\_ color to bromothymol blue and a \_\_\_\_\_ color to phenol red.

Answer: <https://biology-forums.com/index.php?topic=290811>

### Question 2398

If the melting point of copper metal is  $1085^\circ\text{C}$ , what is its melting point in Kelvin?

- A) 571 K
- B) 812 K
- C) 1358 K
- D) 1985 K

Answer: <https://biology-forums.com/index.php?topic=288805>

### Question 2399

What is the average speed (actually the root-mean-square speed) of a carbon monoxide molecule at  $27^\circ\text{C}$ ?

- A) 450 m/s
- B) 412 m/s
- C) 514 m/s
- D) 517 m/s

Answer: <https://biology-forums.com/index.php?topic=289968>

### Question 2400

When a liquid is heated at its boiling point, the

- A) ionic bonds are broken, allowing sublimation to occur.
- B) temperature of the liquid decreases.
- C) temperature of the liquid remains the same as long as any liquid is present.
- D) temperature of the vapor phase decreases.

Answer: <https://biology-forums.com/index.php?topic=290140>

### Question 2401

"Isotopes" are atoms with the same number of \_\_\_\_\_ but different number of \_\_\_\_\_.

- A) electrons, neutrons
- B) neutrons, protons
- C) protons, electrons
- D) protons, neutrons

Answer: <https://biology-forums.com/index.php?topic=291421>

### Question 2402

Which of the following processes are spontaneous?

- I. dissolving more solute in an unsaturated solution
- II. dissolving more solute in a saturated solution
- III. dissolving more solute in a supersaturated solution

- A) none of these
- B) I
- C) I and II
- D) I, II, and III

Answer: <https://biology-forums.com/index.php?topic=290958>

### Question 2403

An aqueous solution of HCl is named

- A) hydrochloric acid.
- B) hydrochlorous acid.
- C) chloric acid.
- D) chlorous acid.

Answer: <https://biology-forums.com/index.php?topic=289013>

### Question 2404

Under which of the following conditions would one mole of Ne have the highest entropy, S?

- A) 29°C and 26 L
- B) 135°C and 26 L
- C) 29°C and 34 L
- D) 135°C and 34 L

Answer: <https://biology-forums.com/index.php?topic=291034>

### Question 2405

Which element has the most favorable (most negative) electron affinity?

- A) B
- B) C
- C) Li
- D) N

Answer: <https://biology-forums.com/index.php?topic=289503>

### Question 2406

What is the name of the complex  $[\text{Ni}(\text{en})_3][\text{Cr}(\text{CN})_6]^{2-}$ ?

- A) ethylenediaminenickel(III) hexacyanochromate(II)
- B) tris(ethylenediamine)nickel(III) hexacyanochromate(II)
- C) tris(ethylenediamine)nickel(II) hexacyanochromate(III)
- D) bis(ethylenediamine)nickel(II) hexacyanochromate(III)

Answer: <https://biology-forums.com/index.php?topic=291511>

### Question 2407

From the phase diagram above, the minimum pressure at which this substance can exist in the liquid phase is

- A) 0.25 atm.
- B) 0.45 atm.
- C) 1.0 atm.
- D) 1.2 atm.

Answer: <https://biology-forums.com/index.php?topic=290128>

### Question 2408

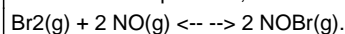
The Cl—Cl bond energy is 199 kJ/mol. Therefore the formation of a single bond between atoms

- A) should require the absorption of 199 kJ per mole of Cl—Cl formed.
- B) should require the absorption of 398 kJ per mole of Cl—Cl formed.
- C) should result in the release of 199 kJ per mole of Cl—Cl formed.
- D) should result in the release of 398 kJ per mole of Cl—Cl formed.

Answer: <https://biology-forums.com/index.php?topic=289622>

### Question 2409

At a certain temperature, bromine and nitric oxide react to form nitrosyl bromide:



When 0.010 mol  $\text{Br}_2$  is mixed with 0.025 mol  $\text{NO}$  and 0.015 mol  $\text{NOBr}$  in a 2.50 L flask, the concentration of  $\text{NOBr}$  decreases. Which statement below is true?

- A)  $K_c < 36$
- B)  $K_c > 36$
- C)  $K_c < 90$
- D)  $K_c > 90$

Answer: <https://biology-forums.com/index.php?topic=290523>

### Question 2410

Which one of the following is the best electrical conductor?

- A) C (diamond)
- B) C (graphite)
- C)  $\text{P}_4$
- D)  $\text{S}_8$

Answer: <https://biology-forums.com/index.php?topic=291769>

### Question 2411

Diopside,  $\text{CaMgSi}_2\text{O}_6$ , is an example of a(n) \_\_\_\_\_ (orthosilicate, single-strand silicate, double-strand silicate, and cyclic silicate).



Answer: <https://biology-forums.com/index.php?topic=291918>

### Question 2412

The average distance between nitrogen and oxygen atoms is 115 pm in a compound called nitric oxide. What is this distance in nanometers?

- A)  $1.15 \times 10^{-2}$  nm
- B)  $1.15 \times 10^{-1}$  nm
- C)  $1.15 \times 10^{15}$  nm
- D)  $1.15 \times 10^{19}$  nm

Answer: <https://biology-forums.com/index.php?topic=288800>

### Question 2413

Which group 3A element exhibits the most nonmetallic character?

- A) B
- B) Tl
- C) Pb
- D) Sb

Answer: <https://biology-forums.com/index.php?topic=291871>

### Question 2414

Arrange the following in order of increasing boiling point.

CH<sub>3</sub>CH<sub>2</sub>OH CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub> H<sub>3</sub>C-O-CH<sub>2</sub>CH<sub>3</sub> CH<sub>3</sub>CH<sub>2</sub>NH<sub>2</sub>

I II III IV

- A) IV < III < II < I
- B) II < III < IV < I
- C) I < IV < III < II
- D) II < III < I < IV

Answer: <https://biology-forums.com/index.php?topic=290144>

### Question 2415

In a periodic table rows are called \_\_\_\_\_ and columns are called \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=289041>

### Question 2416

Which of the following elements is a solid at room temperature?

- A) fluorine
- B) chlorine
- C) bromine
- D) iodine

Answer: <https://biology-forums.com/index.php?topic=291823>

### Question 2417

1.00 mole of O<sub>2</sub> contains the same number of oxygen atoms as

- A) 0.667 mole of O<sub>3</sub>.
- B) 1.00 mole of CH<sub>3</sub>CO<sub>2</sub>H.
- C) 2.00 mole of CH<sub>3</sub>CH<sub>2</sub>OH.
- D) All of the above

Answer: <https://biology-forums.com/index.php?topic=289075>

### Question 2418

The number of unpaired electrons in square planar PtCl<sub>4</sub><sup>2-</sup> is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291595>

### Question 2419

Which of the following compounds has the highest boiling point?

- A) CH<sub>3</sub>CH<sub>2</sub>OH
- B) HOCH<sub>2</sub>CH<sub>2</sub>OH
- C) H<sub>3</sub>C—O—CH<sub>3</sub>
- D) CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>

Answer: <https://biology-forums.com/index.php?topic=290089>

### Question 2420

CH<sub>3</sub>CO<sub>2</sub>H is an example of a \_\_\_\_\_ electrolyte.

Answer: <https://biology-forums.com/index.php?topic=289343>

### Question 2421

The superconductor Tl<sub>2</sub>Ba<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>10</sub> has a critical temperature T<sub>c</sub> = 125 K. In order for each of the atoms to have a whole-number oxidation number, the oxidation numbers of Tl, Ba, Ca, Cu, and O must be \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, respectively.

Answer: <https://biology-forums.com/index.php?topic=291702>

### Question 2422

What volume of 0.716 M KBr solution is needed to provide 13.0 g of KBr?

- A) 6.55 mL
- B) 9.31 mL
- C) 18.5 mL
- D) 153 mL

Answer: <https://biology-forums.com/index.php?topic=290215>

### Question 2423

A 0.429-g sample of gas occupies 125 mL at 60. cm of Hg and 25°C. What is the molar mass of the gas?

- A) 8.9 g/mol
- B) 66 g/mol
- C) 88 g/mol
- D) 106 g/mol

Answer: <https://biology-forums.com/index.php?topic=289945>

### Question 2424

Which of the following is true?

- A) The Bohr atom is the model currently accepted for electrons in atoms.
- B) Electrons travel around the nucleus in circular orbits.
- C) There is a 5% chance of finding an electron in an atom outside its orbital.
- D) The square of the wave function gives the probability of finding the electron.

Answer: <https://biology-forums.com/index.php?topic=289382>

### Question 2425

How many h orbitals are allowed in a given shell?

- A) 5
- B) 6
- C) 11
- D) 13

Answer: <https://biology-forums.com/index.php?topic=289387>

### Question 2426

How many moles and how many atoms of zinc are in a sample weighing 34.9 g?

- A) 0.533 mol, 8.85 × atoms
- B) 0.533 mol, 3.21 × atoms
- C) 1.87 mol, 3.10 × atoms
- D) 1.87 mol, 1.13 × atoms

Answer: <https://biology-forums.com/index.php?topic=288909>

### Question 2427

A gaseous compound, C, undergoes catalytic decomposition at an initial rate of 0.45 M/s when [C]<sub>0</sub> = 3.0 × 10<sup>-3</sup> M and 0.45 M/s when [C]<sub>0</sub> = 9.0 × 10<sup>-3</sup> M. Therefore, this is a \_\_\_\_\_ order reaction.

Answer: <https://biology-forums.com/index.php?topic=290471>

### Question 2428

Which one of the following compounds exhibits the strongest hydrogen bonding between its molecules?

- A) H F
- B) H Cl

- C) H Br
- D) H I

Answer: <https://biology-forums.com/index.php?topic=291855>

### Question 2429

What is the concentration of an  $\text{AlBr}_3$  solution if 150. mL of the solution contains 250. mg of  $\text{Br}^-$  ion?

- A)  $6.95 \times 10^{-3}$  M
- B)  $2.08 \times 10^{-2}$  M
- C) 1.67 M
- D)  $6.23 \times 10^{-3}$  M

Answer: <https://biology-forums.com/index.php?topic=289214>

### Question 2430

In which set do all elements tend to form anions in binary ionic compounds?

- A) Cs, B, O
- B) Ca, Zn, Pb
- C) N, Sb, Bi
- D) S, Cl, Br

Answer: <https://biology-forums.com/index.php?topic=289002>

### Question 2431

What mass of sulfur hexafluoride,  $\text{SF}_6$ , has the same number of fluorine atoms as 25.0 g of oxygen difluoride,  $\text{OF}_2$ ?

- A) 0.901 g
- B) 8.33 g
- C) 22.5 g
- D) 203 g

Answer: <https://biology-forums.com/index.php?topic=289139>

### Question 2432

Consider  $\text{Li}^+$ ,  $\text{F}^-$ , and  $\text{O}_2^-$ . Which ratio should be the largest?

- A)  $(\text{radius Li}^+)/(\text{radius F}^-)$
- B)  $(\text{radius Li}+)/(\text{radius O}_2^-)$
- C)  $(\text{radius F}^-)/(\text{radius Li}^+)$
- D)  $(\text{radius O}_2^-)/(\text{radius Li}^+)$

Answer: <https://biology-forums.com/index.php?topic=289482>

### Question 2433

At a given temperature the vapor pressures of benzene and toluene are 183 mm Hg and 59.2 mm Hg, respectively. Calculate the total vapor pressure over a solution of benzene and toluene with  $X_{\text{benzene}} = 0.520$ .

- A) 95.2 mm Hg
- B) 121 mm Hg
- C) 124 mm Hg
- D) 242 mm Hg

Answer: <https://biology-forums.com/index.php?topic=290309>

### Question 2434

Which has the least kinetic energy?

- A) a 1200 kg object moving at 90 km/hr
- B) a 1400 kg object moving at 85 km/hr
- C) a 1600 kg object moving at 80 km/hr
- D) a 1800 kg object moving at 75 km/hr

Answer: <https://biology-forums.com/index.php?topic=288767>

### Question 2435

For a reaction that follows the general rate law,  $\text{Rate} = k[\text{A}][\text{B}]^2$ , what will happen to the rate of reaction if the concentration of B is increased by a factor of 1.50? The rate will

- A) decrease by a factor of  $1/2.25$ .
- B) decrease by a factor of  $1/1.50$ .
- C) increase by a factor of 1.50.
- D) increase by a factor of 2.25.

Answer: <https://biology-forums.com/index.php?topic=290420>

### Question 2436

Molarity is defined as \_\_\_\_\_, whereas molality is defined as \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=290328>

### Question 2437

A methane molecule contains 1 atom of carbon. The number 1 represents how many significant figures?

- A) one
- B) two
- C) three
- D) infinite

Answer: <https://biology-forums.com/index.php?topic=288824>

### Question 2438

Each of three identical 15.0-L gas cylinders contains 7.50 mol of gas at 295 K. Cylinder A contains HCN, cylinder B contains CO<sub>2</sub>, and cylinder C contains O<sub>3</sub>. According to the kinetic molecular theory, which gas has the highest pressure?

- A) HCN
- B) CO<sub>2</sub>
- C) O<sub>3</sub>
- D) All have identical pressures

Answer: <https://biology-forums.com/index.php?topic=290036>

### Question 2439

A small block of wood or heavy clothing can form an effective shield against what type of radiation?

- A) beta particles
- B) cosmic rays
- C) gamma rays
- D) neutrons

Answer: <https://biology-forums.com/index.php?topic=291408>

### Question 2440

How many d electrons are there on the Fe metal atom in Li<sub>3</sub>[Fe(OH)<sub>6</sub>]?

- A) 1
- B) 3
- C) 5
- D) 6

Answer: <https://biology-forums.com/index.php?topic=291576>

### Question 2441

The pH of a 0.150 M formic acid/0.250 M sodium formate buffer = \_\_\_\_\_? The K<sub>a</sub> of formic acid is 1.8 × 10<sup>-4</sup>.

Answer: <https://biology-forums.com/index.php?topic=290940>

### Question 2442

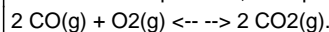
Round off 327,504 to three significant figures.

- A) 327
- B) 328
- C) 3.27 × 10<sup>5</sup>
- D) 3.28 × 10<sup>5</sup>

Answer: <https://biology-forums.com/index.php?topic=288836>

### Question 2443

At a certain temperature, K<sub>c</sub> equals 1.4 × 10<sup>2</sup> for the reaction:



If a 5.00-L flask contains 0.400 mol of CO<sub>2</sub> and 0.100 mol of O<sub>2</sub> at equilibrium, how many moles of CO are also present in the flask?

- A) 1.20 mol
- B) 0.239 mol
- C) 0.107 mol
- D) 0.0114 mol

Answer: <https://biology-forums.com/index.php?topic=290579>

### Question 2444

What is the O—S—O bond angle in SO<sub>3</sub>?

- A) less than 109.5°
- B) 109.5°
- C) 120°
- D) greater than 120°

Answer: <https://biology-forums.com/index.php?topic=289723>

### Question 2445

In a nuclear reaction, the symbol for a beta particle is \_\_\_\_\_.

Answer: <https://biology-forums.com/index.php?topic=291457>

### Question 2446

Predict the product(s) of the reaction of Br<sub>2</sub>(aq) with I<sup>-</sup>(aq).

- A) No reaction
- B) IBr<sub>3</sub>(aq)
- C) BrO<sub>3</sub><sup>-</sup>(aq) and I<sub>2</sub>(aq)
- D) Br<sup>-</sup>(aq) and I<sub>2</sub>(aq)

Answer: <https://biology-forums.com/index.php?topic=291830>

### Question 2447

Molecular orbitals extending over more than two atoms provide an explanation for

- A) coordinate covalent bonding.
- B) ionic bonding.
- C) paramagnetism.
- D) resonance.

Answer: <https://biology-forums.com/index.php?topic=289705>

### Question 2448

The vertical columns of the periodic table are called

- A) groups.
- B) periods.
- C) triads.
- D) elements.

Answer: <https://biology-forums.com/index.php?topic=288867>

### Question 2449

For which one of the following reactions will  $K_c = K_p$ ?

- A)  $\text{CO(g)} + 2 \text{H}_2\text{(g)} \rightleftharpoons \text{CH}_3\text{OH(g)}$
- B)  $\text{NiO(s)} + \text{CO(g)} \rightleftharpoons \text{Ni(s)} + \text{CO}_2\text{(g)}$
- C)  $2 \text{O}_3\text{(g)} \rightleftharpoons 3 \text{O}_2\text{(g)}$
- D)  $\text{COF}_2\text{(g)} \rightleftharpoons \text{CO(g)} + \text{F}_2\text{(g)}$

Answer: <https://biology-forums.com/index.php?topic=290572>

### Question 2450

Manganese crystallizes in a body-centered cubic structure. What is the coordination number of each atom?

- A) 4
- B) 6
- C) 8
- D) 12

Answer: <https://biology-forums.com/index.php?topic=290160>

### Question 2451

Which transition element is difficult to oxidize with hydronium ion?

- A) Ti
- B) Cu
- C) Mn

D) Zn

Answer: <https://biology-forums.com/index.php?topic=291559>

### Question 2452

The density of lead is 11.3 g/cm<sup>3</sup>. The volume occupied by 227 g of lead is \_\_\_\_\_ cm<sup>3</sup>.

Answer: <https://biology-forums.com/index.php?topic=288853>

### Question 2453

Given that hypohalous acids form by the following reaction,

which of the following changes will increase the yield of HOX?

- A) add water
- B) add X-
- C) decrease the pH
- D) increase the pH

Answer: <https://biology-forums.com/index.php?topic=291835>

### Question 2454

When temperature-volume measurements are made on 1.0 mol of gas at 1.0 atm, a plot V versus T results in a

- A) hyperbola.
- B) parabola.
- C) sine curve.
- D) straight line.

Answer: <https://biology-forums.com/index.php?topic=289923>

### Question 2455

What is the magnitude of the change in pH when 0.005 moles of HCl is added to 0.100 L of a buffer solution that is 0.100 M in CH<sub>3</sub>CO<sub>2</sub>H and 0.100 M NaCH<sub>3</sub>CO<sub>2</sub>? The K<sub>a</sub> for acetic acid is  $1.8 \times 10^{-5}$ .

- A) 0.00
- B) 0.20
- C) 0.47
- D) 1.30

Answer: <https://biology-forums.com/index.php?topic=290841>

### Question 2456

Determine the number of water molecules necessary to balance the reduction half reaction of \_\_\_\_\_ that occurs in an acidic solution.

- A) 2
- B) 4
- C) 5
- D) 7

Answer: <https://biology-forums.com/index.php?topic=291083>

### Question 2457

The greater the electronegativity difference between two bonded atoms, the

- A) greater the bond order.
- B) greater the covalent character of the bond.
- C) greater the ionic character of the bond.
- D) more unstable the bond.

Answer: <https://biology-forums.com/index.php?topic=289595>