Question Source:

Praxis Chemistry Sample Test

In a laboratory experiment, crystals are heated in a dry glass test tube using a Bunsen burner. During heating, a clear liquid is observed inside the mouth of the test tube. Which of the following is the most reasonable conclusion drawn from this observation?

(A) The gas fuel used to heat the crystals forms water as it burns.

(B) The crystals give off water when heated.

(C) The crystals give off both hydrogen and oxygen gases that combine to form water.

(D) Condensation from the air collects on the test tube as the crystals are heated.

1. The crystals when heated may give off water in the form of steam. When this moist air reaches the top of the tube, condensation occurs inside the top of the tube because the tube is cooler than the rising warmer air. The correct answer is (B).

Question Source:

Praxis Chemistry Sample Test

Suppose that a mixture of 8 g of sugar, 5.20 g of salt, and 100.01 g of flour is prepared. What is the total mass of the mixture expressed in exponential notation and with the correct number of significant figures?

(A) 1×10^2 g

(B) 1.1×10^2 g

(C) 1.13×10^2 g

(D) 1.132×10^2 g

2. For addition, the correct number of significant figures to the right of the decimal point in the answer is the same as the smallest number of digits to the right of the decimal point in any of the terms to be added. In this example, that number is zero, which gives 113 as the total mass of the mixture to the correct number of significant figures. The number is then converted to exponential notation. The correct answer is (C).

Question Source:

Praxis Chemistry Sample Test

Use of a small quantity of which of the following gases in a classroom requires special consideration because the gas is poisonous?

(A) Steam

(B) Hydrogen

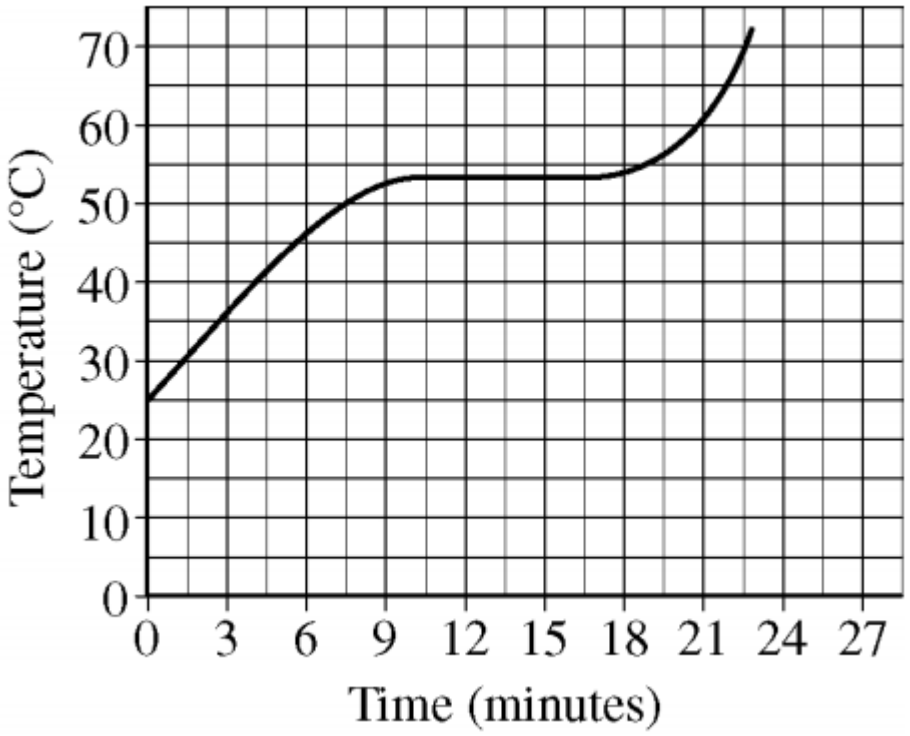
(C) Hydrogen sulfide

(D) Carbon dioxide

3. Of the gases listed, only hydrogen sulfide is poisonous in small quantities. The correct answer is (C).

Question Source:

Praxis Chemistry Sample Test



A sample of a pure solid substance is heated at a constant rate and its temperature recorded as a function of time. A graph of the data is shown above. At about what temperature is the heat added being used to melt the substance?

(A) 25°C

(B) 41°C

(C) 53°C

(D) 60°C

4. When a substance is heated, its temperature increases unless it is undergoing a phase change. During melting, the temperature remains constant since the energy absorbed is being used to do work against the attractive forces in becoming liquid particles. In the diagram, melting begins around nine minutes and a temperature around 53°C. The correct answer is (C).

Question Source:

Praxis Chemistry Sample Test

Changes in which the entropy of the system increases include which of the following?

I. Melting ice at room temperature

II. Evaporating water at room temperature

III. Dissolving NaCl in room-temperature water

(A) I only

(B) III only

(C) I and II only

(D) I, II, and III

5. Entropy is a measure of disorder. In all three cases, the disorder of the system increases. The correct answer is (D).

Question Source:

Praxis Chemistry Sample Test

Isotope	Isotopic Mass (amu)	Percent Abundance
41	40.9	10.0%
44	43.9	30.0%
46	45.9	60.0%

A fictional element with the three naturally occurring isotopes described above would be listed in the periodic table with an atomic mass of

(A) 42.1

(B) 43.6

(C) 44.8

(D) 45.9

6. A quick calculation using the isotope mass, (0.1 x 40.9) + (0.3 x 43.9) + (0.6 x 45.9) = 44.8, gives the correct answer, (C).

Question Source:

Praxis Chemistry Sample Test

In an attempt to compare the half-lives of two radioactive elements, X and Y, a scientist set aside 400 g of each. After six months, the scientist found that 25 g of X and 200 g of Y remained. Which of the following statements is true?

(A) The half-life of Y is twice the half-life of X.

(B) The half-life of Y is four times the half-life of X.

(C) The half-life of Y is eight times the half-life of X.

(D) Unless the exact time interval is established, a comparison cannot be made.

7. Element X decayed from 400 g to 25 g, in a time period of 4 half-lives. Element Y decayed from 400 g to 200 g, in a time period of 1 half-life. Y decays slower than X, and the half-life of Y is 4 times that of X. The correct answer is (B).

Question Source:

Praxis Chemistry Sample Test

Which of the following statements is correct about any chemical reaction that is at equilibrium?

(A) The molecules stop reacting.

(B) Only side reactions continue; the main reaction stops.

(C) Forward and backward reactions occur at equal rates.

(D) There are as many molecules of reactant as there are molecules of product.

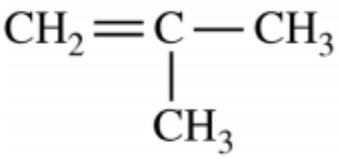
8. The correct answer is (C). The definition of an equilibrium is that the forward and backward reactions occur at equal rates.

Question Source:

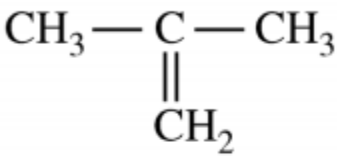
Praxis Chemistry Sample Test

Which, if any, of the following structural formulas represent the same compound?

Structure I



Structure II



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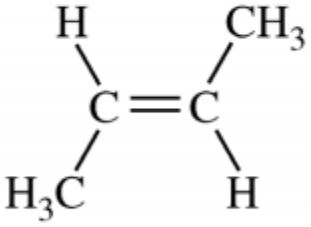
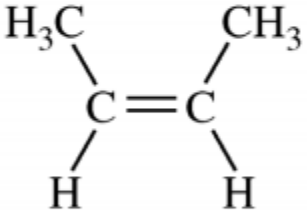


Structure IV



(A) I and II only

(B) III and IV only

(C) I, II, III, and IV

(D) None of the formulas represent identical compounds.

9. The correct answer is (A). I and II are the same compound, 2-methyl-1-propene. III and IV are *cis* and *trans* isomers. They are geometric isomers with different properties.

Question Source:

Praxis Chemistry Sample Test

The correct formula for copper (I) sulfate is

(A) $CuSO_4$

(B) Cu_2SO_4

(C) Cu_4SO

(D) Cu_4SO_4

10. The correct answer is (B). Copper (I) is $\mathbf{Cu^{+}}$ and sulfate is $\mathbf{SO_4^{2-}}$; therefore, for charge neutrality the compound is Cu_2SO_4.

Question Source:

Praxis Chemistry Sample Test

The pH of a 4.0×10^{-4} M HCl solution is between

(A) 2 and 3

(B) 3 and 4

(C) 4 and 5

(D) 5 and 6

11. (B) is the correct answer. HCl dissociates completely, $[H^+] = 4.0 \times 10^{-4}\ M$ and the pH is between 3 and 4.

Question Source:

Praxis Chemistry Sample Test

$Ag^+ + e^- \rightarrow Ag(s) \quad E^0 = +0.80\ V$

$Cr^{3+} + 3e^- \rightarrow Cr(s) \quad E^0 = -0.74\ V$

Based on the standard reduction potentials for chromium and silver shown above, what is the cell potential for the reaction below?

$3\,Ag^+ + Cr(s) \rightarrow 3\,Ag(s) + Cr^{3+}$

(A) 0.06 V

(B) 1.54 V

(C) 1.66 V

(D) 3.14 V

12. The correct answer is (B).

$$E = E^0(\mathrm{Ag}) - E^0(\mathrm{Cr}) = 0.80 + 0.74 = 1.54$$

Question Source:

Praxis Chemistry Sample Test

Liquids with molecules held together by van der Waals forces only have which of the following properties?

(A) High solubilities in water

(B) High melting points

(C) Low boiling points

(D) Significant electrical conductivities in the solid phase

14. Van der Waals forces is the collective name for weak attractive forces between molecules. In general, liquids held together only by these forces have low boiling points relative to their molecular weights since only weak forces must be overcome during vaporization. Thus, (C) is the correct answer.

Question Source:

Praxis Chemistry Sample Test

The solubility product, K_{sp} for $Mg(OH)_2$ is 1.0×10^{-11}. What is the concentration of Mg^{2+} in a saturated solution of this base?

(A) $\sqrt{5.0 \times 10^{-12}}$ M

(B) $\sqrt{1.0 \times 10^{-11}}$ M

(C) $\sqrt[3]{2.5 \times 10^{-12}}$ M

(D) $\sqrt[3]{1.0 \times 10^{-11}}$ M

15. The K_{sp} of a salt is the product of the ion concentrations in a saturated solution. In the present case, $K_{sp} = [Mg^{2+}][OH^-]^2$.

Since $[OH^-] = 2[Mg^{2+}]$,

$K_{sp} = [Mg^{2+}](2[Mg^{2+}])^2 =$

$4[Mg^{2+}]^3 = 1.0 \times 10^{-11}$.

Solving for Mg^{2+} one obtains

$[Mg^{2+}] = [1.0 \times 10^{-11}/4]^{1/3}$. The correct answer is (C).

Question Source:

Praxis Chemistry Sample Test

When 0.50 mol of octane, C_8H_{18}, is burned completely and the reaction products are brought to 20°C and 1 atmosphere, the products include approximately

(A) 18 moles of water

(B) Close to 100 liters of carbon dioxide

(C) Close to 180 liters of carbon dioxide

(D) Close to 200 liters of water vapor

16. The equation for the reaction is
$2\ C_8H_{18} + 25\ O_2 \rightarrow 16\ CO_2 + 18\ H_2O$.
(B) is correct; 0.5 mol octane produces 4 mol of CO_2, which, at 20°C, occupies

$$\frac{(4\,\text{mol} \times 22.4\,\text{L/mol})293\,\text{K}}{273\,\text{K}} = 96\,\text{L} \cong 100\,\text{L}$$

Question Source:

Praxis Chemistry Sample Test

Which of the following properties of a substance depends on the amount of the sample?

(A) Temperature

(B) Radioactive decay half-life

(C) Density

(D) Inertia

17. Inertia is a property of a substance that is proportional to its mass and, therefore, depends on the amount of the sample. The correct answer is (D).

Question Source:

Praxis Chemistry Sample Test

What quantity of oxygen, O_2, contains very nearly the same number of molecules as 36.0 grams of water, H_2O ?

(A) 64.0 grams

(B) 32.0 grams

(C) 16.0 grams

(D) 8.0 grams

18. The correct answer is (A). Thirty-six grams of water is 2 moles (2 x 18 grams). A 2-mole sample of O_2 contains the same number of molecules as does 2 moles of any other molecular substance. A 2-mole sample of O_2 would have a mass of 2 x 32.0 grams = 64.0 grams.

Question Source:

Praxis Chemistry Sample Test

In the reaction of solutions of silver nitrate and sodium phosphate, a silver precipitate is formed. The balanced net ionic equation for this reaction is

(A) $Ag^+ + PO_4^{3-} \rightleftharpoons Na^+ + AgPO_4(s)$

(B) $Ag^+ + PO_4^{3-} \rightleftharpoons AgPO_4(s)$

(C) $3\,Ag^+ + PO_4^{3-} \rightleftharpoons Ag_3PO_4(s)$

(D) $4\,Ag^+ + PO_4^{3-} \rightleftharpoons Ag_4PO_4(s)$

19. The correct answer is (C). The precipitate formed is Ag_3PO_4. Atoms and net charge must be conserved in a chemical reaction, so the reactants and products must have equal numbers of each type of atom and the same net charge.

Question Source:

Praxis Chemistry Sample Test

Which of the following pairs of elements have a valence of +3 ?

(A) Al and Ga

(B) N and O

(C) Li and Na

(D) F and Cl

20. The correct answer is (A). The valences of Al and Ga are both +3.

Question Source:

Praxis Middle School Science Sample Test

Finding that a solution conducts an electric current shows conclusively that the solution

(A) has a high boiling point

(B) contains molecules

(C) is a good oxidizing agent

(D) contains ions

2. The correct answer is (D). Substances whose water solutions conduct an electric current are called electrolytes. Electrolytes, when in solution, break down into smaller particles called ions.

Question Source:

Praxis Middle School Science Sample Test

I. Boron atom, atomic number 5, atomic mass 13

II. Carbon atom, atomic number 6, atomic mass 11

III. Carbon atom, atomic number 6, atomic mass 12

IV. Nitrogen atom, atomic number 7, atomic mass 13

Consider the atoms described above. Which of the following are isotopes of each other?

(A) I and IV only

(B) II and III only

(C) II and IV only

(D) III and IV only

3. The correct answer is (B). Isotopes are atoms of the same element that have different atomic masses. In order to be the same element, they must have the same number of protons. Therefore, they must possess different numbers of neutrons if they are isotopes.

Question Source:

Praxis Middle School Science Sample Test

Some substances have no noticeable odor because these substances

(A) are soluble in water

(B) cannot lose the heat that must be lost before an odor can be detected

(C) have relatively few molecules escaping into the air

(D) do not have molecules with one of the two molecular arrangements required to give an odor

4. The correct answer is (C). In order for us to smell a particular substance, it must enter the nasal cavity via the air. In addition, it must be sufficiently soluble in water to dissolve in the fluid coating of the cells lining the nasal cavity.

Question Source:

Praxis Middle School Science Sample Test

What quantity of oxygen, O_2, contains very nearly the same number of molecules as 36.0 grams of water, H_2O?

(A) 64.0 grams

(B) 32.0 grams

(C) 16.0 grams

(D) 8.0 grams

12. The correct answer is (A). 36 grams of water is 2 moles (2 × 18.0 grams). A 2-mole sample of O_2 contains the same number of molecules as does 2 moles of any other substance. A 2-mole sample of O_2 would have a mass of 2 × 32.0 grams = 64.0 grams.

Question Source:

Praxis Middle School Science Sample Test

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

(A) S

(B) Al

(C) Na

(D) Ba

15. The correct answer is (A). S has the smallest atomic radius. The relative atomic radii of the atoms of various elements can be predicted from the position of the element on the periodic table. Going across a row of the periodic table from left to right, the radii get smaller, and going down a column, the radii get larger. The correct order of atomic radii for elements in this question is Ba > Na > Al > S.