

Review Materials:

Chapters covered: 1 (all), 2.1-2.8 (omit section on naming acids), 3.1-3.6 (omit section on combustion analysis and empirical formulas).

Online practice tests that relate to this test: 1a, 1b, 1c, 1d, 2a (4,5), 2b (1,2,4,5), 2c (1,3,4)

Online practice exam 1: all questions except #20.

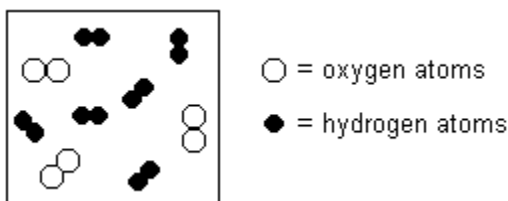
Important Equations and Relationships from Chapters 1, 2, and 3:

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32) \quad \text{K} = ^{\circ}\text{C} + 273 \quad AW_{\text{avg}} = \sum_{i=1}^{i=n} (m_i a_i) \quad N_A = 6.02 \times 10^{23}$$

$$1 \text{ amu} = 1.66054 \times 10^{-24} \text{ g} \quad 1 \text{ in} = 2.54 \text{ cm} \quad 1 \text{ lb} = 453.6 \text{ g} \quad 1 \text{ qt} = 0.946 \text{ L}$$

Practice Questions:

1. The nanoscale diagram shown below depicts a



- pure compound in the gas phase.
 - pure compound in the solid phase.
 - mixture in the gas phase.
 - mixture in the solid phase.
2. Which one of the following occupies the smallest volume?
- a white blood cell
 - a carbon nucleus
 - a hydrogen atom
 - an *e coli* bacterium
3. The Millikan oil drop experiment was used to determine the
- nuclear character of the atom.
 - electron distribution in an atom.
 - charge of an electron.
 - atomic number of an electron.

4. The thickness of a soap film is found to be 6.0 nm. This thickness, expressed in inches, is

- a) 2.4×10^{-7} b) 2.4×10^{-9} c) 1.5×10^{-6} d) 2.4×10^{-3}

5. Which answer completes the following table?

symbol	#protons	#neutrons	#electrons
${}_{56}^{137}\text{Ba}^{2+}$	_____	_____	_____

- a) 56, 81, 56
b) 56, 137, 56
c) 137, 54, 56
d) 56, 81, 54

6. Assume that element X has three naturally occurring isotopes which have masses of 52.62, 56.29, and 58.31. They occur in nature with the abundances 19.61%, 53.91%, and 26.48% respectively. What is the average atomic weight of element X?

- a) 33.33 b) 55.74 c) 57.23 d) 56.11

7. Which one of the following elements is the most metallic?

- a) phosphorus b) silicon c) sodium d) lithium

8. Alkali metals (X) react with halogens (Y) to produce ionic compounds with the general formula

- a) XY b) XY₂ c) X₂Y d) X₂Y₃

9. The correct name for SF₄ is

- a) sulfur fluoride.
b) monosulfur fluoride.
c) sulfur tetrafluoride.
d) monosulfur tetrafluoride.

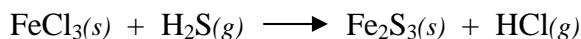
10. The correct formula for the compound formed between aluminum ions and sulfate ions is

- a) Al₂(SO₄)₃ b) AlSO₄ c) Al₂SO₄ d) Al(SO₄)₃

11. How many oxygen atoms are there in 2.5 g of oxygen gas?

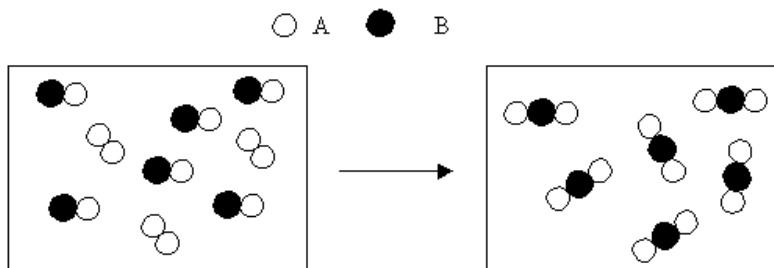
- a) 2.4×10^{22} b) 4.7×10^{22} c) 9.4×10^{22} d) 1.5×10^{24}

12. What is the coefficient on HCl when the following equation is balanced using the smallest whole number coefficients?



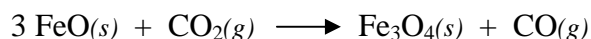
- a) 1 b) 3 c) 6 d) 8

13. Which equation best describes the reaction depicted in the following sub-microscopic diagrams?



- a) $\text{A}_2(g) + \text{B}_2(g) \longrightarrow 2 \text{AB}(g)$
b) $2 \text{AB}(g) + \text{A}_2(g) \longrightarrow 2 \text{A}_2\text{B}(g)$
c) $\text{AB}(g) + \text{A}(g) \longrightarrow \text{A}_2\text{B}(g)$
d) $2 \text{A}_2(g) + \text{B}_2(g) \longrightarrow 2 \text{A}_2\text{B}(g)$

14. How many moles of carbon dioxide are required to completely react with 10 moles of FeO according to the following equation?



- a) 1 b) 3.3 c) 10 d) 30

15. Determine the number of grams of oxygen that would be required to react with iron to produce 10.5 g of iron(III) oxide.

- a) 1.40 g b) 1.94 g c) 2.53 g d) 3.16 g

16. Determine the number of grams of oxygen required to completely combust 12.0 g of glucose (C₆H₁₂O₆). The molar mass of glucose is 180.

- a) 2.13 g b) 6.40 g c) 12.8 g d) 480 g