

**Review Materials:**

Chapters covered: 1 (all), 2.1-2.8 (omit section on naming acids), 3.1 - 3.4

Online practice exam 1: all questions except 20, 21, and 22.

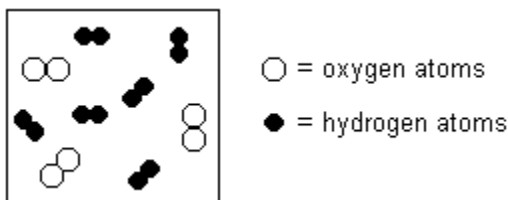
**Important Equations and Relationships from Chapters 1, 2, and 3:**

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

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

**Practice Questions:**

1. The nanoscale diagram shown below depicts a



- a) pure compound in the gas phase.  
b) pure compound in the solid phase.  
c) mixture in the gas phase.  
d) mixture in the solid phase.
2. Which one of the following physical properties could be used to determine if a metallic substance is zinc or aluminum?
- a) mass                      b) volume                      c) melting point                      d) shape
3. Which one of the following occupies the smallest volume?
- a) a white blood cell  
b) a carbon nucleus  
c) a hydrogen atom  
d) an *e coli* bacterium
4. The Millikan oil drop experiment was used to determine the
- a) nuclear character of the atom.  
b) electron distribution in an atom.  
c) charge of an electron.  
d) atomic number of an electron.

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

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

6. 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

7. 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

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

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

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

- a) XY      b) XY<sub>2</sub>      c) X<sub>2</sub>Y      d) X<sub>2</sub>Y<sub>3</sub>

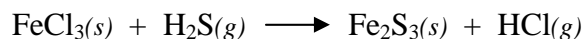
10. The correct name for SF<sub>4</sub> is

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

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

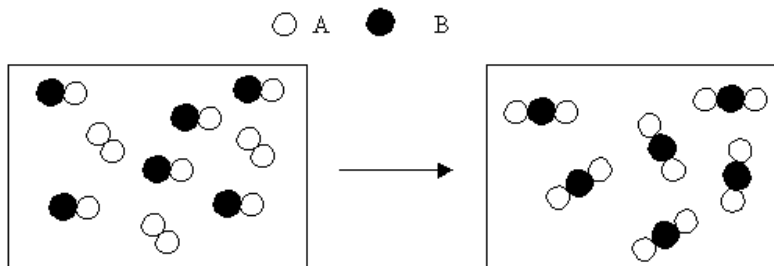
- a) Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>      b) AlSO<sub>4</sub>      c) Al<sub>2</sub>SO<sub>4</sub>      d) Al(SO<sub>4</sub>)<sub>3</sub>

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 oxygen atoms are there in 2.5 g of oxygen gas?

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

15. How many molecules of carbon dioxide are there in 12.5 g of carbon dioxide?

- a) 0.284                      b)  $2.12 \times 10^{24}$   
 c)  $1.71 \times 10^{23}$               d)  $4.72 \times 10^{25}$