AP Chemistry Problem Set #2

1. _____ 2. _____   3. _____ 4. _____ 5. _____

6. _____ 7. _____   8. _____ 9. _____ 10. _____

1. Measurements indicate a charge of 0.444 C passes a point in 0.12 seconds. The current (i.e., the rate of charge flow, in C/s) is best expressed as:
    a. 0.27 C/s   b. 0.270 C/s   c. 3.7 C/s   d. 3.70 C/s   e. 3.700 C/s

2. A given sample contains 2.0 g of hydrogen, 33.1 g of sulfur, and 75.01 g of oxygen. What is the total mass of the sample?
    a. 110.12 g   b. 110.1 g   c. 110. g   d. 1.1×10^2 g   e. 1.1×10^{-2} g

3. The correct name for $Mg(OH)_2$ is:
    a. magnesium hydroxide   b. magnesium(I) hydroxide   c. magnesium(II) hydroxide
    d. magnesium(II) hydroxide(I)   e. magnesium hydrogen oxide

4. The correct name for Co_2O_3 is:
    a. cobalt oxide   b. cobalt(II) oxide   c. cobalt oxide(III)
    d. cobalt(III) oxide   e. dicobalt trioxide

5. The density of copper is 8.96 g/cm^3. What is the mass of 18.88 cm^3 of pure copper?
    a. 1.69 g   b. 16.9 g   c. 169 g   d. 169.0 g   e. 1690 g

6. What is the correct formula for copper(II) phosphate:
    a. $CuPO_4$ b. CuP c. $Cu_3(PO_4)_2$ d. Cu_2P e. Cu_2PO_4

7. The density of a piece of metal can be determined from mass and water displacement data. A piece of metal with a mass of 15.54 g is placed in a flask with a volume of 50.00 cm^3. It is found that 40.54 g of water (d=0.9971 g/cm^3) is needed to fill the flask with the metal in it. The density of the metal is most nearly (all answers in g/cm^3):
    a. 1.66   b. 1.7   c. 9.46   d. 9.5   e. 40.7

8. Examples illustrating the Law of Multiple Proportions shown are:
    I. CO & CO_2
    II. Ca & BaO
    III. CaS & BaS
    IV. Na_2CO_3 & Na_2SO_4
    V. O_2 & O_3

    a. I only   b. I & V   c. III & IV   d. III & V   e. I & III

9. Which of the following is correctly named?
    a. NH_4^+, ammonia   b. $SbCl_5$, antimony hexachloride   c. N_2O_5, nitrogen pentoxide
    d. $CaCl_2$ calcium(II) chloride   e. Hg_2Cl_2, mercury(I) chloride

10. Which of the following elements is a transition metal?
    a. Ca   b. S   c. Fe   d. N   e. Cs

Short Answer

11. Complete the following table:

#p	#n	#e-	mass #	atomic #	net charge	symbol
11	12	10				
			1	1	1+	
						$^{79}_{34}Se^{2-}$
		85	210	85		
	118			79	3+	
19			41		1+	

12. Name each of the following compounds:

a. FeO b. Fe_2O_3 c. PCl_5 d. H_2SO_4 e. V_2O_5

f. $NaHCO_3$ g. K_2SO_3 h. $CoCrO_4$ i. Hg_2O j. $(NH_4)_3PO_4$

13. Write the formulas for each of the following compounds:

a. calcium fluoride b. dinitrogen tetrafluoride c. carbonic acid

d. sodium sulfite e. titanium(IV) oxide f. potassium permanganate

g. nitric acid h. chromium(III) carbonate i. carbon tetrachloride

j. mercury(I) phosphate k. hydrofluoric acid l. sulfur trioxide

14. Identify each of the following elements:

a. a member of the same family as oxygen whose most stable ion contains 54 electrons

b. a noble gas with 18 protons in the nucleus

c. a halogen with 85 protons and 85 electrons

d. a member of the alkali metal family whose most stable ion contains 18 electrons

e. a member of group 17 whose most stable ion contains 10 electrons

15. Suppose that a stable element, atomic number 119, symbol Pe, named Petrassium, is discovered.

a. Would Pe be a metal or a non-metal? Explain/justify your answer.

b. What would be the most likely charge of the Pe ion in stable ionic compounds?

c. An isotope of Petrassium has a mass number of 291. How many neutrons does it have?

d. Write the formula for the compound formed between Pe and the carbonate ion.