Chem B – Unit 2 Review

Chapter 10 Review

1. Convert each of the following to **moles:**

    a. 22.0 g NO_3

    b. 190 g MgF_2

    c. 2.35 x 10^{25} atom K

    d. 18 molecules Na_2O

2. Convert each of the following to **grams:**

    a. 4.10 mol $CaCO_3$

    b. 10.2 mol C_2P_5

    c. 3.01 x 10^{23} atoms Li

    d. 1.2 x 10^{10} molecules $C_5H_{10}O_5$

3. Convert each of the following to **liters:**

    a. 1.567 mol Ne

    b. 3.56 x 10^{27} atoms of He

    c. 6.0 g O_2

    d. 2.51 x 10^{20} molecules CO_2

4. Calculate the **percentage composition** for each element in the following compounds:

    a. $MgCl_2$ c. Pb_2O_3

    b. CaI_2 d. $AuSO_4$

Chem B – Unit 2 Review

5. Calculate the **mass** of the given element in each of the following compounds: hint you may want work from some of the prior problems

  a. chlorine in 75.0 g of $MgCl_2$

  b. gold in 150. g of $AuSO_4$

6. Find the **empirical formula** of a compound that consists of 0.365g sodium, 0.221g of nitrogen and 0.758g oxygen.

7. Find the **empirical formula** for the compound that consists of 47.10% Fe and 52.90% S

8. Find the **empirical formula** for a compound that consists of 52.11% C; 13.14% H; 34.75% O.

9. A compound contains 24.02 g Carbon and 2.02 g Hydrogen. If the compounds molar mass is 78.12 g/mol, what is its **molecular formula**?

10. A compound of Boron and Hydrogen contains 78.11% Boron. If the molar mass of the compound is 27.68 g/mol, what is the **molecular formula** for the compound?

Chapter 11 – Stoichiometry

1. How many moles of $KClO_3$ are needed to prepare 7.1 moles of O_2 according to the reaction
$$2KClO_3 \rightarrow 2KCl + 3O_2$$
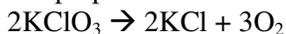
2. How many moles of NaOH are required to react with 0.50 mole H_3PO_4 to form sodium phosphate and water?

3. How many grams of $KMnO_4$ are needed to react completely with 100 g Fe according to
$$3KMnO_4 + 5Fe + 24\ HCl \rightarrow 5FeCl_3 + 3MnCl_2 + 3KCl + 12H_2O$$

4. When 2.0 moles of aluminum combines with iron (III) oxide to form aluminum oxide and iron, how many grams of aluminum oxide are produced?

5. How many grams of H_2O are produced when 0.45 mole of CO_2 are also produced by
$$2KMnO_4 + 5H_2C_2O_4 + 6HCl \rightarrow 2MnCl_2 + 10CO_2 + 2KCl + 8H_2O$$

6. How many grams of H_2SO_4 will be required for the complete reaction of 65.0 g of $Al(OH)_3$
according to the equation: $2Al(OH)_3 + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 6H_2O$

7. The decomposition of 4.0g $MgCO_3$ will yield magnesium oxide and carbon dioxide gas. How many liters of CO_2 will be produced?

8. How many grams of HCl will be required for the complete reaction of 316g KMnO4
according to the equation: $2KMnO_4 + 5H_2C_2O_4 + 6HCl \rightarrow 2MnCl_2 + 10CO_2 + 2KCl + 8H_2O$

9. Identify the limiting reactant

10. Determine the percent yield for the reaction