Types of Reactions – **There are patterns in chemical equations. As you read through pages 224-237 complete each question and look at all the equations throughout the sections notice the patterns that are present (element and/or compounds reacting to form elements and or compounds**

1. Write a definition for each of the following types of chemical reactions on a separate sheet of paper.

(This will be your note to review when trying to answer proceeding questions)

(a) synthesis chemical reaction

(b) decomposition chemical reaction

(c) neutralization reaction

(d) combustion reaction

(e) single displacement reaction

(f) double displacement reaction

2. Identify what type of chemical reaction is described by each of the following general chemical equations?

(a) $AB + CD \rightarrow AD + BC$ _____

(b) $HB + XOH \rightarrow XB + H_2O$ _____

(c) $C_xH_y + O_2 \rightarrow CO_2 + H_2O$ _____

(d) $A + BC \rightarrow B + AC$ _____

(e) $AB \rightarrow A + B$ _____

(f) $A + B \rightarrow AB$ _____

3. Classify each of the following chemical reactions.

(a) $CaCl_2(s) \rightarrow Ca(s) + Cl_2(g)$ _____

(b) $NaN_2(s) \rightarrow Na(s) + N_2(g)$ _____

(c) $2Rb(s) + Cl_2(g) \rightarrow 2RbCl(s)$ _____

(d) $4Li(s) + O_2(g) \rightarrow 2Li_2O(s)$ _____

(e) $2NaCl(s) \rightarrow 2Na(s) + Cl_2(s)$ _____

(f) $2NI_3(aq) \rightarrow N_2(g) + 3I_2(s)$ _____

4. Classify each of the following chemical reactions.

a. $K_2SO_4(aq) + Al(s) \rightarrow Al_2(SO_4)_3(aq) + 2K(s)$ _____

b. $KI(aq) + Pb(NO_3)_2(aq) \rightarrow PbI_2(aq) + KNO_3(aq)$ _____

c. $C_4H_{10}(aq) + O_2(g) \rightarrow CO_2(g) + H_2O(I)$ _____

d. $AgNO_3(aq) + KCl(aq) \rightarrow KNO_3(aq) + AgCl(aq)$ _____

e. $2\ Na + CaCl_2 \rightarrow 2\ NaCl + Ca$ _____

f. $BaCl_2 + 2\ AgNO_3 \rightarrow Ba(NO_3)_2 + 2\ AgCl$ _____

g. $N_2 + 2\ O_2 \rightarrow 2\ NO_2$ _____

h. $2\ Al_2O_3 \rightarrow 4\ Al + 3\ O_2$ _____

5. Classify each of the following reactions, and balance the equations.

(a) $CaCl_2(g) \rightarrow Ca(s) + Cl_2(g)$ _____

(b) $NaN_3(s) \rightarrow Na(s) + N_2(g)$ _____

(c) $Pb(NO_3)_2(aq) + Cu_2SO_4(aq) \rightarrow PbSO_4(s) + CuNO_3(aq)$ _____

(d) $Ni_2O_3(s) \rightarrow Ni(s) + O_2(g)$ _____

(e) $CH_4(g) + O_2(g) \rightarrow CO_2(g) + H_2O(g)$ _____

(f) $NaI(aq) + AlCl_3(aq) \rightarrow NaCl(aq) + AlI_3(s)$ _____

6. Balance the following reactions and indicate which type of chemical reaction is represented.

a) ____ $NaBr$ + ____ $Ca(OH)_2$ → ___ $CaBr_2$ + ____ $NaOH$ _____

b) ____ NH_3 + ____ H_2SO_4 → ____ $(NH_4)_2SO_4$ _____

c) ____ H_2O → ____ O_2 + ____ H_2 _____

d) ____ Pb + ____ H_3PO_4 → ____ H_2 + ____ $Pb_3(PO_4)_2$ _____

e) ____ Li_3N + ____ NH_4NO_3 → ___ $LiNO_3$ + ___ $(NH_4)_3N$ _____

f) ____ HBr + ___ $Al(OH)_3$ → ___ H_2O + ___ $AlBr_3$ _____

(acid) (base)

7. The types of chemical reactions discussed in chapter 6 can be classified by the nature of the reactants. Identify the type of chemical reaction that would occur between the following reactants:

(a) $Li(s) + O_2(g) \rightarrow$ _____

(b) $NaCl(s) \rightarrow$ _____

(c) $K_2SO_4(aq) + Al(s) \rightarrow$ _____

(d) $CaBr_2(aq) + Ba(NO_3)_2(aq) \rightarrow$ _____

(e) $C_4H_{10}(aq) + O_2(g) \rightarrow$ _____

(f) $AgNO_3(aq) + KCl(aq) \rightarrow$ _____

(g) $NI_3(aq) \rightarrow$ _____

8. Convert the following word equations to skeleton equations. Then balance them and classify the reaction.

a. iron + sulphur →iron (II) sulphide Reaction type: _____

b. calcium + oxygen → calcium oxide Reaction type: _____

c. copper (II) oxide → copper + oxygen gas Reaction type: _____

d. water → hydrogen gas + oxygen gas Reaction type: _____

e. iron (III) chloride → iron + chlorine gas Reaction type: _____