Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reaction Unit Overview

**Section 1: Identify the type of reaction**

For the following reactions, indicate whether the following are examples of synthesis, decomposition, combustion, single replacement, or double replacement:

1) Na3PO4 + 3 KOH 🡪 3 NaOH + K3PO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) MgCl2 + Li2CO3 🡪 MgCO3 + 2 LiCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) C6H12 + 9 O2 🡪 6 CO2 + 6 H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) Pb + FeSO4 🡪 PbSO4 + Fe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) CaCO3 🡪 CaO + CO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) P4 + 3 O2 🡪 2 P2O3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7) 2 RbNO3 + BeF2 🡪 Be(NO3)2 + 2 RbF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) 2 AgNO3 + Cu 🡪 Cu(NO3)2 + 2 Ag \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) C3H6O + 4 O2 🡪 3 CO2 + 3 H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) 2 C5H5 + Fe 🡪 Fe(C5H5)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11) 2 MgI2 + Mn(SO3)2 🡪 2 MgSO3 + MnI4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12) 2 NO2 🡪 2 O2 + N2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Section 2: Practicing equation balancing**

For the following equations, write in the coefficients necessary to follow the Law of the Conservation of Matter.

1) \_\_ C6H6 + \_\_ O2 🡪 \_\_ H2O + \_\_ CO2

2) \_\_ NaI + \_\_ Pb(SO4)2 🡪 \_\_ PbI4 + \_\_ Na2SO4

3) \_\_ NH3 + \_\_ O2 🡪\_\_ NO + \_\_ H2O

4) \_\_ Fe(OH)3 🡪 \_\_ Fe2O3 + \_\_ H2O

5) \_\_ HNO3 + \_\_ Mg(OH)2 🡪 \_\_H2O + \_\_ Mg(NO3)2

6) \_\_ H3PO4 + \_\_ NaBr 🡪 \_\_ HBr + \_\_ Na3PO4

7) \_\_ C + \_\_ H2 🡪 \_\_ C3H8

8) \_\_ CaO + \_\_ MnI4 🡪 \_\_ MnO2 + \_\_ CaI2

9) \_\_ Fe2O3 + \_\_ H2O 🡪 \_\_ Fe(OH)3

10) \_\_ C2H2 + \_\_ H2 🡪 \_\_ C2H6

11) \_\_ VF5 + \_\_ HI 🡪 \_\_ V2I10 + \_\_ HF

12) \_\_ OsO4 + \_\_ PtCl4 🡪 \_\_ PtO2 + \_\_ OsCl8

13) \_\_ CF4 + \_\_ Br2 🡪 \_\_ CBr4 + \_\_ F2

14) \_\_ Hg2I2 + \_\_ O2 🡪 \_\_ Hg2O + \_\_ I2

15) \_\_ Y(NO3)2 + \_\_ GaPO4 🡪 \_\_ YPO4 + \_\_ Ga(NO­3)2

**Section 3: Word Problems**

Write out the reaction from the formula names. Make sure you remember to balance formulas and the entire equation.

1) Zinc and lead (II) nitrate react to form zinc nitrate and lead.

2) Aluminum bromide and chlorine gas react to form aluminum chloride and bromine gas.

3) Sodium phosphate and calcium chloride react to form calcium phosphate and sodium chloride.

4) Potassium metal and chlorine gas combine to form potassium chloride.

5) Hydrogen gas and nitrogen monoxide react to form water and nitrogen gas.

**Section 4: Predicting the products of chemical reactions**

For the following equations, write the type of reaction as well as the products. Make sure your final equation is balanced correctly. If it’s a double replacement reaction, make sure you include the states of matter. For three of the questions, you are also asked to include the net ionic equation.

1) \_\_ Ag + \_\_CuSO4 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) \_\_ NaI + \_\_ CaCl2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) \_\_ O2 + \_\_ H2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) \_\_ AgNO2 + \_\_ BaSO4 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Net Ionic:

5) \_\_ HCN + \_\_ CuSO4 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) \_\_ AgBr + \_\_ Co(SO4)2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Net Ionic:

7) \_\_ LiNO3 + \_\_Ag 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) \_\_ Sr + \_\_ O2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) \_\_ H2CO3 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) \_\_ AlCl3 + \_\_ Zn 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11) \_\_ Al(NO3)3 + \_\_ Rb 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12) \_\_ C2H4O2 + \_\_ O2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13) \_\_ C4H8 + \_\_ O2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14) \_\_ KCl + \_\_ Pb(OH)2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Net Ionic:

15) \_\_ Zn + \_\_ Au(NO­3)2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16) \_\_ BaS + \_\_ PtCl2 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17) \_\_ Na2O 🡪 Type:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Section 5: Energy and Reaction Rate**

1) Classify each of the following as endothermic or exothermic:

A. heat + AB 🡪 A + B

B. Energy is absorbed

C. Temperature increases during a reaction

D. A + B 🡪 AB + ∆H

E. energy is released

F. The reaction feels cold

G. 

2) Which of the following will increase the reaction rate:

a. Place the reactants in an ice water bath b. Break a large piece of a reactant into many smaller pieces

c. Add a catalyst to the reaction d. Decrease the concentration of a reactant from 7 M to 5 M