

Name: Key

Name \_\_\_\_\_

Period: \_\_\_\_\_

### Balancing Reactions Worksheet Synthesis and Decomposition

Part A (Review): Balance the following reactions and indicate whether they are *synthesis* (S) or *decomposition* (D) reactions.

- $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$  Type: S
- $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$  Type: D
- $2\text{HgO} \rightarrow 2\text{Hg} + \text{O}_2$  Type: D
- $2\text{Al}_2\text{O}_3(\text{s}) \rightarrow 4\text{Al}(\text{s}) + 3\text{O}_2(\text{g})$  Type: D
- $4\text{P} + 5\text{O}_2 \rightarrow 2\text{P}_2\text{O}_5$  Type: S

Part B: Predict the products and balance the equation:

- $2\text{KBr} \rightarrow 2\text{K} + \text{Br}_2$  Type: D
- $2\text{Li} + \text{Cl}_2 \rightarrow 2\text{LiCl}$  Type: S
- $3\text{Rb}_2\text{O} \rightarrow 4\text{Rb} + \text{O}_2$  Type: D
- $4\text{NiO} \rightarrow 2\text{Ni} + \text{O}_2$  Type: D
- $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{carbonic acid}$  Type: S  
 $\text{H}_2\text{CO}_3$

Part C: Predict the products, balance, and indicate type.

- Potassium chloride is heated vigorously Type: D  
 $2\text{KCl} \rightarrow 2\text{K} + \text{Cl}_2$
- Molten sodium is reacted with chlorine gas Type: S  
 $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$
- Calcium combined with iodine Type: S  
 $\text{Ca} + \text{I}_2 \rightarrow \text{CaI}_2$
- Zinc oxide ore is refined to separate the ore's elements Type: D  
 $2\text{ZnO} \rightarrow 2\text{Zn} + \text{O}_2$
- Aluminum chloride decomposes Type: D  
 $2\text{AlCl}_3 \rightarrow 2\text{Al} + 3\text{Cl}_2$
- Cesium oxide is heated Type: D  
 $2\text{Cs}_2\text{O} \rightarrow 4\text{Cs} + \text{O}_2$
- Sulfur trioxide decomposes Type: D  
 $2\text{SO}_3 \rightarrow 2\text{S} + 3\text{O}_2$
- Potassium and bromine are reacted Type: S  
 $2\text{K} + \text{Br}_2 \rightarrow 2\text{KBr}$
- Potassium and selenium form a compound Type: S  
 $2\text{K} + \text{Se} \rightarrow \text{K}_2\text{Se}$
- Calcium iodide is heated Type: D  
 $\text{CaI}_2 \rightarrow \text{Ca} + \text{I}_2$
- Sodium fluoride is heated Type: D  
 $2\text{NaF} \rightarrow 2\text{Na} + \text{F}_2$
- Iodine reacts with hydrogen to form an acid Type: S  
 $\text{I}_2 + \text{H}_2 \rightarrow 2\text{HI}$

### Worksheet #5: Double-Replacement Reactions

In these reactions, all you do is look at the names of the reactants, and "switch partners". Just be sure that the new pairs come out with the positive ion named first, and paired with a negative ion.

1. aluminum iodide + mercury(II) chloride  $\rightarrow$  aluminum chloride + mercury(II) iodide



2. silver nitrate + potassium phosphate  $\rightarrow$  silver phosphate + potassium nitrate



3. copper(II) bromide + aluminum chloride  $\rightarrow$  copper(II) chloride + aluminum bromide



4. calcium acetate + sodium carbonate  $\rightarrow$  calcium carbonate + sodium acetate



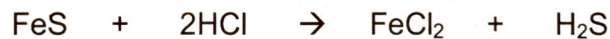
5. ammonium chloride + mercury(I) acetate  $\rightarrow$  ammonium acetate + mercury(I) chloride



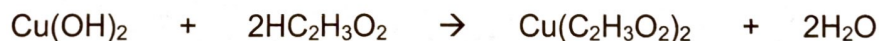
6. calcium nitrate + hydrochloric acid  $\rightarrow$  calcium chloride + nitric acid



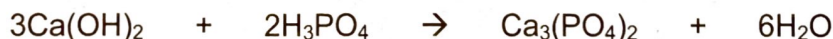
7. iron(II) sulfide + hydrochloric acid  $\rightarrow$  iron(II) chloride + hydrogen sulfide (g)



8. copper(II) hydroxide + acetic acid  $\rightarrow$  copper(II) acetate + water



9. calcium hydroxide + phosphoric acid  $\rightarrow$  calcium phosphate + water



10. calcium bromide + potassium hydroxide  $\rightarrow$  calcium hydroxide + potassium bromide

