

### Predicting Single Replacement, Double Replacement, & Combustion

### Single Replacement

- Element + Compound  $\rightarrow$  Element + Compound
- $A + BX \rightarrow AX + B$
- Can have metal & metal replacement, halogen & halogen replacement, or metal & hydrogen replacement

### Single Replacement

- Need to know your activity series!
- Just look at your Standard Reduction Potential Table

### Single Replacement

- Magnesium turnings are added to a solution of Iron (III) chloride

### Single Replacement

- Sodium is added to water
- Whenever water is added to an element visualize it as HOH (make sure you re write it as H<sub>2</sub>O)

### Single Replacement

- Chlorine gas is bubbled into a solution of potassium fluoride

### Double Replacement

- **Double Replacement** – a reaction involving the exchange of ions between 2 compounds
- Of the form:  $AX + BY \rightarrow BX + AY$

### Double Replacement

- In order for a double replacement reaction to take place, one of 3 things must be formed:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_

Double Replacement # 1  
(Precipitate)

1. A saturated solution of barium hydroxide is mixed with a solution of iron (III) sulfate

Double Replacement # 2  
(Formation of a gas)

2. Formation of a gas (acid + sulfide, sulfite, carbonate, or bicarbonate)
  - Hydrobromic acid is added to a solution of potassium bicarbonate

Double Replacement # 3

3. Sodium hydride is placed into water

Double Replacement #4  
(Acid Base neutralization)

- Acid + base  $\rightarrow$  salt + water
- Hydrogen sulfide gas is bubbled through excess potassium hydroxide solution

## Combustion

1. Hydrocarbon +  $O_2 \rightarrow CO_2 + H_2O$ 
  - Combustion of methane