

## Double Displacement Reactions:

### A. Precipitation Reaction: formation of a solid precipitate:

*Introductory Discussion: (listen, don't worry about note taking.)*

Pure water does not conduct an electric current. A *non-electrolyte*. **Demonstrate with conductivity apparatus**. When ionic substances are placed in water they dissociate and as free ions would conduct an electric current, *electrolytes*. Most ionic materials only contain two types of ions. **Ex. When ions of  $\text{AgNO}_3$  are placed in solution they appear as  $(\text{Ag}^+$  and  $\text{NO}_3^-)$ . In a separate beaker ions of  $\text{NaCl}$  appear as  $\text{Na}^+$  and  $\text{Cl}^-$ . If these 4 ions are mixed a solid precipitate is formed.** What possible identity could the solid have? Rationalize with possibilities. Introduce Solubility Rules (P.183, Table 7.1 and back cover of textbook). Discuss **solubility rules handout** to distinguish soluble (disappears) Vs, insoluble (remains undissolved) salts. Write balanced equation with phase notation for reaction of silver nitrate and sodium chloride.

### Net Ionic Equations

### B. Neutralization Reaction: Formation of water

Acids and bases neutralize to form salt and water. Acid + Base  $\rightarrow$  Ionic Salt and Water  
Both are electrolytes. Net ionic:  $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$

	Acids	Bases
Taste	Sour	Bitter
Arrhenius	Produces $\text{H}^+$ (proton) in solution	Produces $\text{OH}^-$ (hydroxide ions) in solution
Ex.	$\text{HCl}$ , $\text{HNO}_3$ , $\text{H}_2\text{SO}_4$ , see ion sheet	$\text{NaOH}$ , $\text{KOH}$ , $\text{NH}_3$ , $\text{Ba}(\text{OH})_2$
Litmus	Red	Blue
pH	Below 7	Above 7

Ex. Reaction of hydrochloric acid and potassium hydroxide, with phase notation

Ex. Reaction of sulfuric acid and sodium hydroxide, with phase notation

### C. Formation of a gas.. Gas escapes as bubbles

Ex. Decomposition of carbonates:  $\text{PbCO}_{3(s)} \rightarrow \text{PbO}_{(s)} + \text{CO}_{2(g)}$

Ex. "Volcano";  $\text{HC}_2\text{H}_3\text{O}_{2(aq)} + \text{NaHCO}_{3(s)} \rightarrow \text{NaC}_2\text{H}_3\text{O}_{2(aq)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(l)}$