

Chapter Nine: Chemical Reactions

Section Three: Reactions in Aqueous Solutions

Aqueous solution: contains one or more substances called solutes dissolved in water

- **Solute:** substance being dissolved
- **Solvent:** substance doing the dissolving
 - In our case, water will always be our solvent

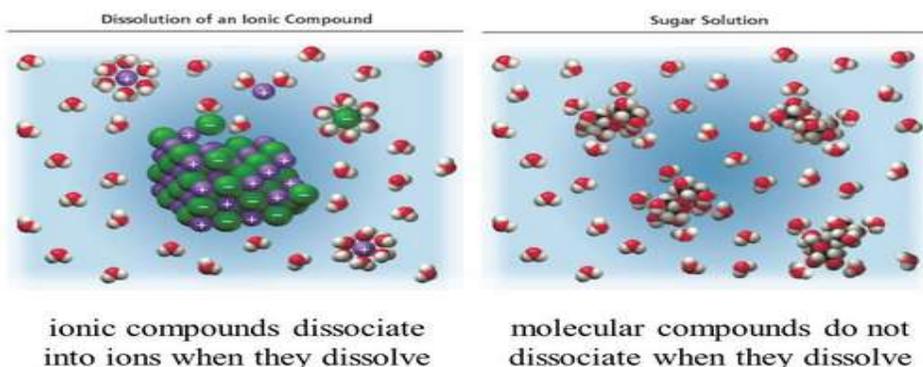
Molecular compounds in solution:

- Molecular (covalent) compounds stay together when dissolved in water.
- Sucrose (table sugar) and ethanol (alcohol in vehicles) remain intact when dissolved

Ionic compounds in solution:

- Ionic compounds form ions when they dissolve in water
 - *Dissociation:* when ionic compounds dissolve in water, their ions separate
- Compounds that dissociate into Hydrogen ions and a negative ion are referred to as **acids**

Salt vs. Sugar Dissolved in Water



Complete ionic equation: an ionic equation that shows all the particles in a solution as they exist

Spectator ions: ions that do not participate in a reaction

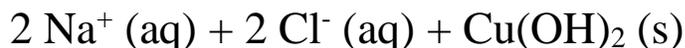
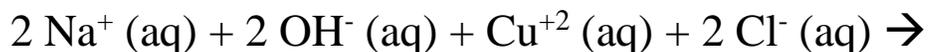
Net ionic equations: ionic equations that include only the particles that participate in the reaction

Reactions that form precipitates:

- Sodium hydroxide reacts with copper (II) chloride



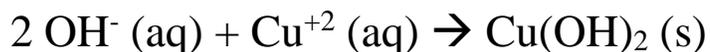
- Complete ionic equation



- Spectator ions: $2 \text{Na}^+ \text{ (aq)}$ and $2 \text{Cl}^- \text{ (aq)}$

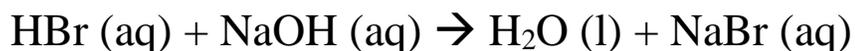
- Cross those out of complete ionic equation

- Net ionic equation:

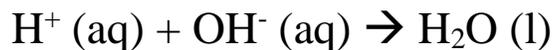


Reactions that form water: (Acid-Base reactions)

- The water produced increases the number of solvent particles.
- No evidence of a chemical reaction since water is colorless, odorless, and makes up most of the solution
- Hydrochloric acid reacts with sodium hydroxide



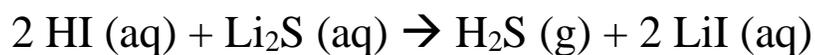
- Net ionic equation:



Reactions that form gases:

- Gases commonly produced are Carbon dioxide, hydrogen cyanide, or hydrogen sulfide

- Hydroiodic acid reacts with lithium sulfide



- Net ionic equation:

