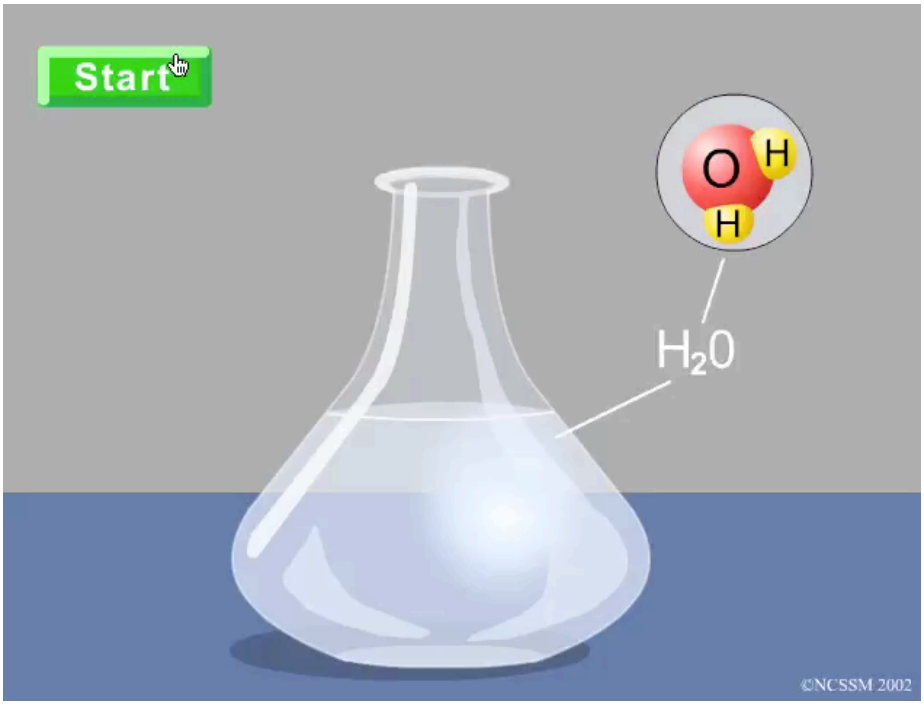
Aqueous Solutions & Precipitation Reactions

Precipitation Reactions

General Properties of Aqueous Solutions

- Solution Types
  - Non-electrolytes (don't conduct electricity)
    - Solutes are soluble
    - Don't form ions in solution
    - Don't conduct electricity
    - Sugar (molecular solutes)
  - Electrolytes (conduct electricity)
    - Solutes are soluble
    - Form ions in solution
    - Conduct Electricity
    - Table Salt (ionic solutes)


Start
O
H
H
H_2O
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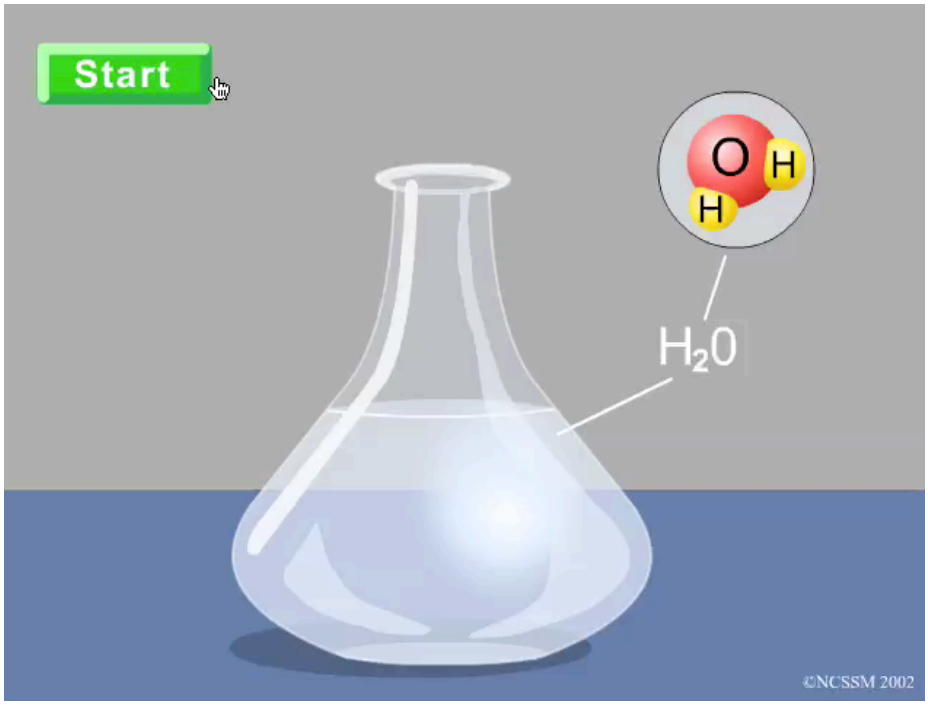
Start
O
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H_2O
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Precipitation Reactions

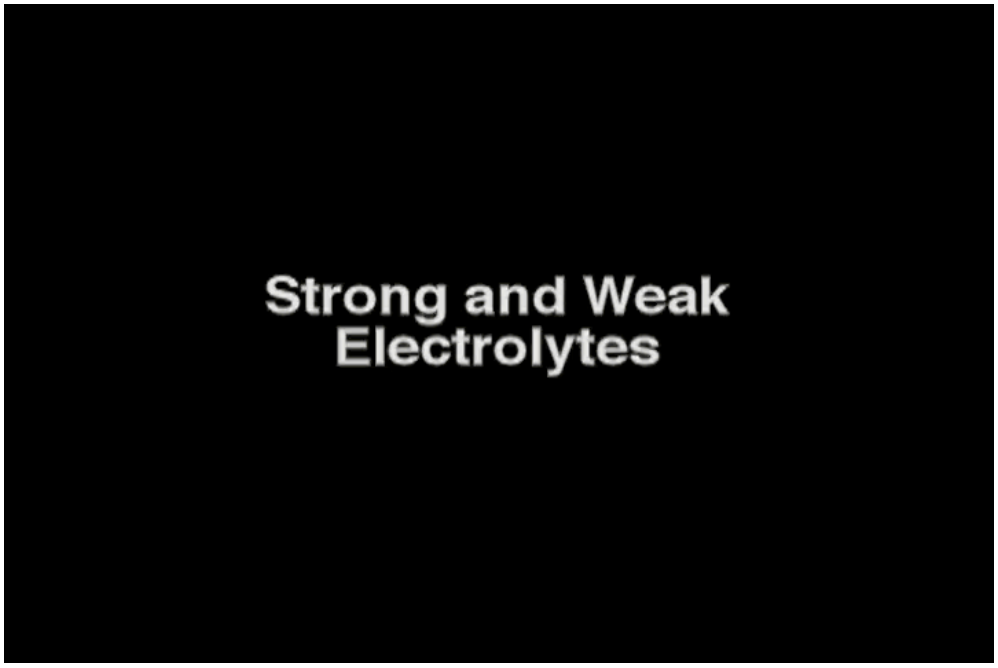
Type of Electrolytes

- Strong Electrolytes
  - Completely ionize in water
  - Good conductors of electricity
- Weak Electrolytes
  - Only partially ionize in water
  - Reach an equilibrium containing ions and nonionized particles
  - Weak conductor of electricity

Precipitation Reactions

Type of Electrolytes

- Strong Electrolytes
  - All soluble ionic substances
    - Soluble salts
    - Strong bases
  - Strong Acids
- Weak Electrolytes
  - Weak acids
  - Weak Bases
    - NH_3 and others
  - Partly soluble salts



Precipitation Reactions

Definitions

- Precipitation Reaction
  - Reaction that forms a precipitate
    - An insoluble product of a chemical reaction
  - Double displacement reactions
    - Most precipitation reactions are double displacement
    - A double trading of partners
- In order to represent precipitation reactions we must understand solubility rules
  - See page 121

Precipitation Reactions

Foundational Chemistry

- 1 M lead II nitrate solution reacting with 0.5 M potassium iodide solution

Precipitation Reactions

Net Ionic Equation Definitions

- Complete Molecular Equations
  - Shows the complete chemical formulas for the reactants and products
- Complete Ionic Equation
  - Shows all soluble strong electrolytes as ions
- Spectator Ions
  - Substances that appear as ions on both sides of the equation
  - They are present, but not involved in the reaction
- Net Ionic Equation
  - The equation that remains when the spectator ions are removed from the complete ionic equation

Precipitation Reactions

Homework

- 4.2, 3, 5 (assume Pb^{2+}), 14 (draw the two solutions), 17, 20, 22, 23, 26, 29