7.1 Solubility

Definitions

- Saturated solution
- Solubility
- Solubility curve
- Immiscible
- Miscible
- Crystallization
- High solubility (≥0.1 mol/L)
- Low solubility (< 0.1 mol/L)
- Insoluble
- Precipitate
- The Solvay Process

Solubility of Solids

- CRC Handbook of Chemistry and Physics is a source for solubility data.
- Temperature, volume of solvent, and mass of solute is important.

Solubility Curves

- As temperature changes so does the ability to dissolve a solute.
- See figure 2 on page 316 to see the dramatic difference in solubility for KNO_3 from 0ºC to 50ºC.

Solubility in Gases

- Gases are also soluble.
- O_2 dissolves in water and allows for aquatic creatures to survive.
- CO_2 dissolves in soft drinks and it is super saturated and will "gas out" when opened.

Solubility in Water

- Know all the points on page 319 and how it relates to the solubility and water.
    - Solids more soluble at high temperature
    - Gases more soluble at low temperature
    - Most non polar liquids don't dissolve in water
    - Most polar liquids dissolve in water
    - Elements of the periodic table don't normally dissolve in water

Crystallization

- As a solvent evaporates you will be left with just the solute and the solute will re-crystallize.
- Eg. Evaporate sea water to get sea salt.

Solubility Categories

- Some compounds have high solubility.
- Some compounds have low solubility.
- Some compounds are insoluble and can precipitate out.
- Precipitate is when a compound "falls out of solution".
- E.g. silver nitrate (aq) + sodium chloride (aq) → sodium nitrate (aq) + silver chloride (s)

The Solvay Process – An Effect of Solubility

- Read it and know it.
- Why was it important?

Homework

- Practice Q's: 1-2, 4,6-8, 11-13,16 & Section Q's: 1-2