

- Terms:
  - Solute, solvent, solution
  - Miscible, immiscible
  - Soluble, insoluble
  - Saturated, unsaturated, supersaturated
- Properties of Solutions
  - homogeneous
  - molecules or ions
  - colored or colorless (is there another option??)
  - physically separable
- Solvation: Understand the process and predict solubilities
  - Figure 14.3
  - "Like dissolves like"
  - Polar, and nonpolar solvents (Lewis structures + dipoles)
  - Ionic vs Covalent molecules
- Effect of Pressure on Solubility
  - Solids: little effect
  - Gases: big effect. Solubility  $\propto$  Pressure (Ex. Can of soda pop)
- Effect of Temperature on Solubility
  - Solids: generally  $\uparrow T = \uparrow$  solubility (difficult to predict exactly, and many exceptions exist ( $\text{Li}_2\text{SO}_4$ ) and rate of can vary dramatically. See Figure 14.4)
  - Gases: big effect.  $\uparrow T = \downarrow$  solubility (Ex. boiling water)
- Four properties that effect the rate of solids dissolving in liquids
  - Particle Size/Surface Area: only the surface of a particle can dissolve.  $\uparrow$  surface area =  $\uparrow$  rate of dissolving (Figure 14.5)
  - Temperature:  $\uparrow T = \uparrow$  rate of dissolving. Kinetic energy effect.
  - Concentration:  $\uparrow$  concentration =  $\downarrow$  rate of dissolving. (Figure 14.6)
  - Agitation or Stirring: combines effects of the above kinetic effect, surface area and concentration.
- Why do reactions occur faster between or in liquids than between solids?
- Solution Math
  - Table 14.4 (do not memorize this, it will be given)
  - Molarity
  - Mass Percent (m/m)
  - Mass/Volume Percent (m/v)
  - Volume Percent (v/v)
  - Molality
  - Dilutions ( $M_1V_1 = M_2V_2$ ) M = Molarity V = Volume

9. Colligative Properties

- (a) Definition
- (b) Freezing Point Depression - Fig 14.8 (b)
- (c) Melting Point Elevation - Fig 14.8 (a)
- (d) Calculations involving Colligative Properties

10. Osmosis

- (a) Semipermeable membrane
- (b) osmosis
- (c) osmotic pressure
- (d) isotonic
- (e) hypotonic
- (f) hypertonic
- (g) Fig. 14.9