

Chap. 13:

• Solution formation

1. Enthalpy, H – favorable intermolecular interactions
 - **Intermolecular** interactions of *Solvent-solute vs. solvent-solvent and solute-solute*
2. Entropy, S – increased disorder (ΔH_{mix}) ($\Delta H_{\text{solvent}}$) (ΔH_{solute})

• Solubility

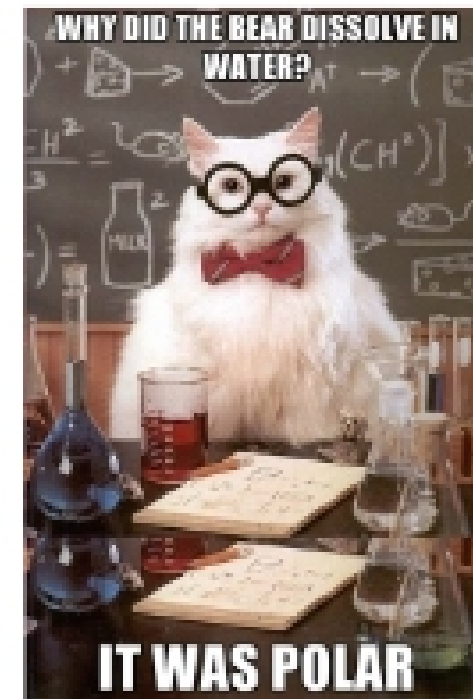
1. Influence of pressure – Henry's Law
2. Influence of molecular structure – “like dissolves like”
 - **Factors** affecting solubility in H₂O
3. Influence of temperature

• Concentration

1. Mass %, ppm, ppb
2. Mole fraction
3. Molarity
4. Molality

• Colligative properties

1. van't Hoff factor, *i*
2. Vapor Pressure – Raoult's Law
3. Boiling pt. elevation & Freezing pt. depression
4. Osmosis



1. Which of the compounds below is the LEAST miscible with water?



2. In general, as the temperature of a solution increases, the solubility of a gas solute _____.

(A) Increases

(B) Decreases

(C) Remains the same

(D) Varies from gas to gas

Boiling Point Elevation and Freezing Point Depression

- **Note:** ΔT not dependent on *what* the solute is, but on *how many solute particles* are dissolved (**i**).

$$\Delta T_b = (i)(K_b)(m)$$

$$\Delta T_f = (i)(K_f)(m)$$