Ch. 13 concept map (Solutions and Their Behavior)

1. Perform calculations using various concentration units (molality, mole fraction, weight percent, parts per million).
2. Understand how saturated solutions form and what happens if we attempt to add more solute to saturated solutions.
3. Understand why certain liquids are miscible in each other, while others are immiscible. Apply the concept of "like dissolves like" to explain miscibility of liquids and solubility of solids in liquids.
4. Calculate the enthalpy of a solution from thermodynamic data (lattice enthalpy and enthalpy of hydration or enthalpies of formation).
5. Know that solubility of gases in a liquid increases with gas pressure; perform calculations using Henry's law.
6. Know the effect of temperature on solubility of gases and solids in liquids.
7. Perform calculations using colligative properties.
   a. Use Raoult's law to calculate the vapor pressure of a volatile component (typically liquid) in a solution.
   b. Use equations for boiling point elevation, freezing point depression and osmotic pressure to calculate various properties of solutions (e.g., boiling point of the solution, molar mass of the solute…).
   c. Apply the van't Hoff factor in calculations involving solutions of electrolytes (ionic solutes).
8. Explain what constitutes a colloid.
9. Explain how surfactants (soaps) are used to remove nonpolar substances (e.g., oil) from surfaces.