HW1: Solutions

1. 3 factors affect how quickly a solute will dissolve in a solvent: stirring, temperature, and surface area. Explain **how** each factor affects the solute as it dissolves.
2. Define the following terms:
   1. Solute
   2. Solvent
   3. Unsaturated
   4. Saturated
   5. Supersaturated
   6. Dilute
   7. concentrated
3. Explain how a solution can be unsaturated but concentrated at the same time.
4. Compare and contrast molarity and molality.
5. Molarity Problems
   1. If you dissolve 92.6g of sucrose (C12H22O11) in 0.75L of solution, what is the molarity?
   2. What mass of Ca(OH)2 was dissolved into 2.50L of solution to make a 0.88M solution?
6. Molality Problems
   1. 39.6g of NaOH is dissolved into 990g of water. What is the molality?
   2. What mass of K2CO3 is dissolved in 1.25 kg of water to make a 1.65m solution?
7. Dilutions Problems
   1. You have 1.2L of a 6.54M solution of NaCl and boil away enough water so that only 0.67L is left, what is the new molarity of the solution?
   2. Given 1.00L of a 4.34M solution of H2SO4 and you add 0.55L more to the solution, what is the new molarity?
8. Colligative Properties
   1. What is the boiling point of a solution made by dissolving 21g of NaCl in 559g of water?
   2. Calculate the freezing point of an antifreeze solution containing 388g of ethylene glycol, C2H6O2, in 409g of water.