AP Chemistry

Dr. Wilhelm

**Chapter Fourteen Reading Guide: Solutions and their Behavior**

*On a separate piece of paper, write a response to the following reading prompts while reviewing chapter fourteen of your textbook.*

1. Define the term solutions. What is meant by the term colligative properties? What properties of a solvent are affected by the addition of a solute.
2. How is solution concentration determined using the following parameters: molarity, molality, mole fraction and weight (mass) percent?
3. When is a solution considered saturated and why is this described as a dynamic equilibrium?
4. What is solubility? What are the units used to describe solubility?
5. Distinguish between the terms miscible and immiscible.
6. What is meant by the phrase, “likes dissolve likes”? What factors drive the solubility of ionic compounds in water?
7. Relate the enthalpy of solution to: ΔH lattice  and ΔHhydration . How does the size of the ion and the charge influence the enthalpy of a solution?
8. Explain the role of pressure and temperature on the solubility of gas/liquid and solid/liquid solutions.
9. Review the solubility curve in Figure 14-11. Notice the effect of temperature on the solubility of these ionic compounds. What does the role of enthalpy play in the shape of the curve? What would the curve look like for a gas/liquid solution?
10. Define Henry’s law. What is the equilibrium system established in a gas/liquid solution?
11. Review the concepts of Le Chatelier’s principle as it applies to gas solubility. These concepts will be addressed again when we specifically address equilibrium conditions.

1. Take a moment to read the case study: Exploding lakes & diet coke- these are very interesting applications of Henry’s law!
2. Explain Raoult’s law and how it is used to define vapor pressure.
3. Identify the calculations associated with the colligative properties of boiling point and freezing point.
4. What is osmotic pressure and how is it affected by solution concentration?
5. Define the term reverse osmosis and site one example which relies on this process.
6. Review the process for determining the molar mass of a substance based on colligative properties (examples 14.8 & 14.9).
7. What is meant by the term isotonic? How does this relate to IV therapy?
8. Relate colligative properties to electrolytes and the use of van’t Hoff Factor (*i*).
9. What are colloids and what is meant by the term Tyndall effect?
10. Distinguish between the terms sol and gel.
11. Briefly describe how a colloid dispersion is stabilized.
12. What is an emulsion? How does and emulsifying agent keep this mixture from separating?