Things to Know for Quiz 10

Chem 30A, Fall 2019

Chapter 12

1. Define "vapor pressure." What does it depend on?
2. What happens when the vapor pressure equals the external pressure?
3. What is the "normal boiling point"?
4. Calculate the amount of energy absorbed or released during vaporization or condensation, given the value of ΔH_{vap}. OR calculate the amount of substance that can be vaporized/condensed, given some amount of energy. [Ch. 12 #49-56]
5. Phase changes happen at a constant temperature. Be able to sketch the graph for temperature vs. heat added for a substance (usually, we draw it for water). [Ch. 12 #39-40]
6. Sketch the shape of the curve in a graph of vapor pressure vs. temperature for a liquid. Explain the significance. [Ch. 12 #47-48]
7. Calculate the amount of energy absorbed or released during melting or freezing, given the value of ΔH_{fus}. OR calculate the amount of substance that can be melted/frozen, given some amount of energy. [Ch. 12 #57-62]
8. What is "sublimation"? What is the opposite of sublimation?
9. Know the names of each of the different phase changes, and know whether each process is exothermic or endothermic.
10. List and explain all of the different types of intermolecular forces. (See the yellow handout on IMFs!)
11. Which types of molecules have London dispersion forces? Which types of molecules have dipole-dipole forces? Which types are able to hydrogen bond? [Ch. 12 #63-68]
12. Given structures of molecules, state what types of intermolecular forces they have. [Ch. 12 #63-68]
13. Given a list of substances, rank them in order of strength of intermolecular forces or in order of boiling point or in order of heat of vaporization or in order of vapor pressure. Explain your reasoning thoroughly. [Ch. 12 #69-74, 87-88, practice problems on IMFs #1, 2, 3]
14. Recognize whether a solid is molecular, ionic, or metallic. [Ch. 12 #79-82]
15. For each of the types of solids (molecular, ionic, metallic, or covalent network), what are the particles and what holds things together?
16. For each of the types of solids, would you expect it to have a low, medium, or high melting point? Why? [Ch. 12 #83-86]
17. List all of the unusual properties of water.

(continued on the next page)

Chapter 13

1. A solution is a homogeneous mixture.
2. What is the difference between the solute and the solvent? [Ch. 13 #3, 25, 26]
3. Like dissolves like [Ch. 12 #75-78, Ch. 13 #23-24, 27-28, Practice Problems on IMFs #4]
4. Given two substances, predict whether or not they will mix/form a solution. [Ch. 12 #75-78, Ch. 13 #23-24, 27-28, Practice Problems on IMFs #4]
5. Given a list of substances, rank them in order of solubility in water or in a nonpolar solvent. (More hydrogen bonding groups per carbon = more soluble in water. The order or ranking of solubility in a nonpolar solvent will be the opposite order.) [Practice Problems on IMFs #5]
6. Be able to calculate the molarity of a solution. [Ch. 13 #59-64]
7. Given the molarity of a solution, be able to write it as a conversion factor.
8. Given the molarity of a solution, determine either the volume of solution or the amount of solute. (Use M as a conversion factor). [Ch. 13 #65-80]
9. Dilutions: add water to make a less concentrated solution.
10. Be able to do problems involving dilutions. Use $M_1V_1 = M_2V_2$. Remember that V_2 is the total final volume. (find the concentration after a dilution, find the volume needed, find the volume of water needed, etc.) [Ch. 13 #81-88]
11. Volume (in liters) × Molarity (moles/L) = moles of solute.
12. Stoichiometry problems involving solutions: there are many variations of this type of problem. Step 1: balance the equation. Step 2: find moles of whatever you can. Step 3: Use the balanced equation to convert to moles of the desired substance. Step 4: Convert moles to the desired unit. In this chapter, you will use molarity as a conversion factor between volume of solution and moles of solute. [Ch. 13 #89-96, 115]