**Honors Chemistry**

**Chapter 12: Solutions, Concentrations, and Colligative Properties**

1. By referring to the figure below, determine whether the addition of 40 g of each of the following ionic solids to 100 g of water at 40 ᵒC will lead to a saturated or unsaturated solution.

a. NaNO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. KCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. KClO3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The solubility of gases in water \_\_\_\_\_\_\_\_\_\_ as molar mass increases.
2. Increases
3. Decreases
4. Stays the same
5. The solubility of gases in liquids \_\_\_\_\_\_\_\_\_\_\_\_\_ as their pressure decreases.
6. Increases
7. Decreases
8. Stays the same
9. The solubility of liquids and solids \_\_\_\_\_\_\_\_\_\_\_\_\_ as their pressure decreases.
10. Increases
11. Decreases
12. Stays the same
13. The solubility of solubility of solids in liquids \_\_\_\_\_\_\_\_\_\_\_\_\_ as temperature increases.
14. Increases
15. Decreases
16. Stays the same
17. The solubility of gases in liquids \_\_\_\_\_\_\_\_\_\_\_\_\_ as temperature increases.
18. Increases
19. Decreases
20. Stays the same
21. What is the molarity of a solution made by dissolving 10 g of ammonium sulfate into 500 mL of water?
22. What is the molarity of a solution made by diluting 250 mL of a 3.5 Molar to 750 mL?
23. What is the molality of a solution formed by dissolving 50 g of calcium fluoride in 750 g of water?
24. What is the molality of a solution formed by dissolving 50 g of carbon tetrachloride in 100 mL of benzene? The density of the resulting solution is found to be 0.847 g/mL.
25. Assume you dissolve 2.56 g of malic acid, C4H6O5, in half a liter of water (500.0 g). Calculate the mole fraction, mass percentage, ppm, and ppb of acid in the solution.
26. What is the osmotic pressure of a solution formed by dissolving 44.2 mg of aspirin (C9H8O4) in 0.358 L of water at 25 ᵒC?
27. The normal boiling point of CCl4 is 76.8 ᵒC and its Kb = 5.02 C/*m*. Calculate the boiling point of a solution made by dissolving 15 g of decane, C10H22, in 49.5 g CCl4.
28. Calculate the freezing point of a solution made by dissolving 13 g potassium sulfide in 150 g H2O. Kf for water = 1.86 C/*m*.
29. Glycerin (C3H8O3) has a density of 1.26 g/mL. Calculate the vapor pressure of a solution made by adding 50.0 mL of glycerin to 500.0 mL of water. The vapor pressure of pure water is 23.8 torr.