**SCH3U1 – Homework Questions on Solubility and Solubility Curves**

1. Explain why and how temperature affects the solubility of a solid in a liquid.

*Use the solubility curves given to answer the following questions. Assume the density of water is 1.00 g/mL*

1. Calculate the solubility of each of the following in g of solute/100 g of water:

 a. 0.62 g dissolves in 15.0 mL of water.

b. 75.0 g dissolves in 350.0 mL of water.

  c. 0.250 kg dissolves in 1.20 L.

d. 24.0 g dissolves in 280.0 g of water.

1. Determine the solubility of the following in g solute/L water.

a. 260.0 g of a solid dissolves in 1500.0 mL of water.

b. 0.160 kg of a solid dissolves in 225.0 g of water.

1. At what temperature is the solubility of the substance specified? (All in water)

a. NH4Cl 60.0 g/100 g

b. KNO3 120.0 g/100 g

c. NaNO3 1200.0 g/L

d. KClO3 100.0 g/500.0 g

1. What is the solubility, in g/ 100g water, of the following at the specified temperature?

 a. NaNO3 at 40°C

b. Ce2(SO4)3 at 25°C

c. NH3 at 30°C

d. NH4Cl at 5°C

1. How much more NH4Cl can you dissolve in 100 g water at 60°C than at 20°C?
2. If you prepared a saturated solution of NaNO3 at 80°C then cooled it to 30°C, what would happen? Be specific.
3. At which temperature do NaNO3 and KNO3 have the same solubility? NaCl and NH3?
4. How much water is needed to dissolve 65.0 g of NaNO3 at 35°C?
5. A saturated solution of KNO3 in 200.0 g of water at 50°C is cooled to 20°C. How much KNO3 settles out?
6. What temperature is necessary to dissolve twice as much KNO3 as can be dissolved at 30°C?
7. If the solubility of a solid in water is 118.0 g/L, how much water would you need to dissolve a piece of the same solid with a mass of 45.0 g?
8. If 18.0 g of KNO3 are dissolved in 15.0 mL of water at 100°C, at what temperature will the solid begin to settle out?
9. If 40.0 g of KNO3 is added to 50.0 mL of water at 40°C will it all dissolve? If not, how much would be left over?  If you raised the temperature to 45°C, will it all dissolve? Give evidence.
10. What temperature is necessary to just dissolve 150 g of KClO3 in 200.0 mL of water?
11. If 142 g of NH4Cl are dissolved in 350.0 mL of water at 55°C, is the solution saturated?

