**Practice**



Use the solubility curves above 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.
	1. 0.62 g dissolves in 15 mL of water.
	2. 75.0 g dissolves in 350. mL of water.
	3. 0.250 kg dissolves in 1.2 L.
	4. 24.0 g dissolves in 280 g of water.
2. Determine the solubility of the following in g solute/L water.
	1. 260 g of a solid dissolves in 1500 mL of water.
	2. 0.160 kg of a solid dissolves in 225 g of water.
3. At what temperature is the solubility of the substance specified? (All in water)
	1. NH4Cl 60 g/100g
	2. KNO3 120 g/100 g
	3. NaNO3 1200 g/L
	4. KClO3 100 g/500 g
4. What is the solubility, in g/ 100g water, of the following at the specified temperature?
	1. NaNO3 at 40°C
	2. Ce2(SO4)3 at 25°C
	3. NH3 at 30°C
	4. NH4Cl at 5°C
5. How much more NH4Cl can you dissolve in a Litre of water at 60°C than at 20°C?
6. If you prepared a saturated solution of NaNO3 at 80°C then cooled it to 30°C, what would happen? Be specific.
7. At which temperature do NaNO3 and KNO3 have the same solubility? NaCl and NH3?
8. How much water is needed to dissolve 65.0 g of NaNO3 at 35°C?
9. A saturated solution of KNO3 in 200. g of water at 50°C is cooled to 20°C. How much

KNO3 will settle out?

1. What temperature is necessary to dissolve twice as much KNO3 as can be dissolved at 30°C?
2. If the solubility of a solid in water is 118 g/L, how much water would you need to dissolve a piece of the same solid with a mass of 45.0 g?
3. 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?
4. 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
5. What temperature is necessary to just dissolve 150 g of KClO3 in 200. mL of water?
6. If 142 g of NH4Cl are dissolved in 350 mL of water at 55°C, is the solution saturated?

**Answers**

* 1. 4.13 g/100 g H2O
	2. 21.4 g/100 g H2O
	3. 20.8 g/100 g H2O
	4. 8.57 g/100 g H2O
	5. 173 g/L H2O
	6. 711 g/L H2O
	7. 68°C
	8. 63°C
	9. 56°C
	10. 46°C
	11. 106 g/100 g
	12. 16 g/100 g
	13. 48 g/100 g
	14. 32 g/100 g
1. You can dissolve 17g/100g more
2. 55 g of NaNO3 will settle out for every 100 g of water.
3. 68°C, 41°C
4. 65 g water
5. 112 g KNO3 will settle out
6. 53°C
7. 0.38 L or 380 mL are needed to dissolve 45 g of solute
8. KNO3 will begin settling out at 62°C.
9. At 40°C solubility of KNO3 is about 68 g/100 g water. Not all the solute will dissolve. 80 g – 68 g = 12 g 🡪12 g will not dissolve at 40°C. At 45°C, the solubility is about 79 g/100 g water. Not all the solute will dissolve.
10. 95°C
11. The solution is unsaturated.