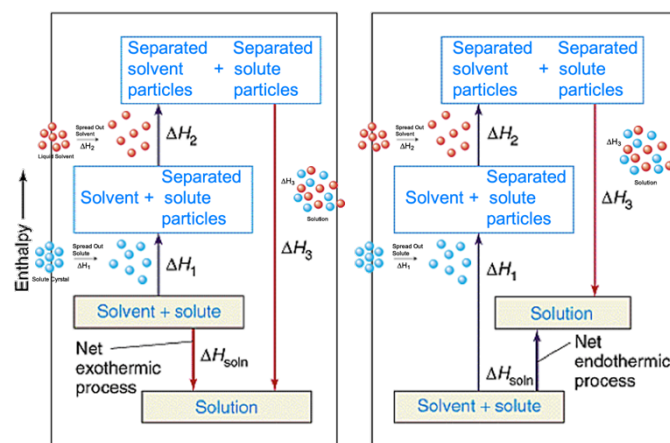


## Chem 2 AP Homework #12-1: Solutions & Solubility

Problems pg. 520 # 1, 6, 7, 9, 11, 12, 25, 27, 28, 34, 36, 83, 84

12.1 Distinguish between an unsaturated solution, a saturated solution, and a supersaturated solution.

12.6 Provide a molecular interpretation for the difference between an endothermic and exothermic solution process.



12.7 Explain why the solution process invariably leads to an increase in disorder.

12.9 Why is naphthalene ( $\text{C}_{10}\text{H}_8$ ) more soluble than CsF in benzene ( $\text{C}_6\text{H}_6$ )?

12.11 Arrange  $\text{O}_2$ ,  $\text{LiCl}$ ,  $\text{Br}_2$  and  $\text{CH}_3\text{OH}$  in order of solubility in  $\text{H}_2\text{O}$ .

12.12 Explain the variations in solubility of the alcohols in the table at right.

Compound	Solubility in Water (g/100g) at 20°C
CH <sub>3</sub> OH	∞
CH <sub>3</sub> CH <sub>2</sub> OH	∞
CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> OH	∞
CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> OH	9
CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> OH	2.7

12.25 How do the solubilities of most ionic compounds in water change with temperature? With pressure?

12.27 3.20 g of a salt dissolves in 9.10 g H<sub>2</sub>O to give a saturated solution at 25°C. What is the solubility (in g salt/100 g H<sub>2</sub>O) of the salt?

12.28 The solubility of KNO<sub>3</sub> is 155 g/100g H<sub>2</sub>O at 75°C and 38.0 g at 25°C. What mass of KNO<sub>3</sub> will crystallize out of solution if exactly 100 g of its saturated solution at 75°C is cooled to 25°C? Remember that the solution mass consists of both solute and solvent mass.

Solubility at 75°C: 155 g KNO<sub>3</sub> / 100 g H<sub>2</sub>O; solubility at 25°C: 38.0 g KNO<sub>3</sub> / 100 g H<sub>2</sub>O.

12.34 A student bought a goldfish in a pet shop, brought it home and placed it in water that had been boiled and quickly cooled. Explain why the goldfish was found dead a while later.

- 12.36** A miner working 260 m below sea level opened a carbonated soda during a lunch break. To his surprise, the soda tasted “flat.” Shortly afterward, he took an elevator to the surface and continually belched. Why was the soda flat at the bottom of the mine, but the miner continually belched on the trip up to the surface?
- 12.83** What are colloids? Referring to Table 12.4, why is there no colloid in which both the dispersed phase and the dispersing medium are gases?
- 12.84** Describe how hydrophilic and hydrophobic colloids are stabilized in water. (See §12.8 in text.)