

Unit 6 – Chapter 11: Solutions & IMFs

Name _____

Take-home quiz

Period _____

- 1) A solution is made containing 14.6 g of CH_3OH in 184 g of H_2O . Calculate a) the mole fraction of CH_3OH , b) the mass percent of CH_3OH , and c) the molality of CH_3OH .

- 2) The density of toluene (C_7H_8) is 0.867 g/mL and the density of thiophene ($\text{C}_4\text{H}_4\text{S}$) is 1.065 g/mL. A solution is made by dissolving 10.0 g of thiophene in 250.0 mL of toluene. Calculate a) the mole fraction of thiophene in the solution, b) the molality of thiophene in the solution, and c) assuming that the volumes of the solute and solvent are additive, what is the molarity of thiophene in solution?

- 3) Calculate the number of moles of solute present in each of the following aqueous solutions: a) 600. mL of 0.250 M SrBr_2 , b) 0.180 m KCl containing 86.4 g of water, c) 124.0 g of a solution that is 6.45% glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) by mass.

- 4) Commercial aqueous nitric acid has a density of 1.42 g/mL and is 16 M. Calculate the percent HNO_3 by mass in the solution.

- 5) Commercial concentrated aqueous ammonia is 28% NH_3 by mass and has a density of 0.90 g/mL. What is the molarity of this solution?

- 6) Caffeine ($\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$) is a stimulant found in coffee and tea. If a solution of caffeine in chloroform (CHCl_3) as a solvent has a concentration of 0.0750 m, calculate a) the percent caffeine by mass, b) the mole fraction of caffeine.