Homework #9
Problems (#56-#60)

56. [adapted from Raff #8.22]
Ten grams of a non-volatile solute are added to 5 moles of a solvent whose total volume is 200 cm^3. The partial molar enthalpy of fusion of the solvent is 2,000 cal mol^{-1} , and its normal freezing point is 280 K. The solvent in the solution freezes at 279.894 K. Calculate the osmotic pressure of the solution at 300 K, assuming that the solution is ideal.

57. E&R P9.7
P9.7 The osmotic pressure of an unknown substance is measured at 298 K. Determine the molecular weight if the concentration of this substance is 31.2 kg m^{-3} and the osmotic pressure is 5.30×10^4 Pa. The density of the solution is 997 kg m^{-3}.
[note: the given solution density (997 kg m^{-3}) is ***IRRELEVANT*** *, not needed].*

58. [Adapted from Raff #9.29]
The solubility product constant K_{sp} (expressed in molality reference) for $BaCl_2(s)$ is 176.94 at 298.15 K. The measured solubility of $BaCl_2(s)$ in water at that temperature is 370.43 g (kg^{-1} *water*). Determine the mean ionic activity coefficient for $BaCl_2$ at saturation.

59. E&R P11.12

60. E&R P11.16 [the temperature of the cell is 298.15K]