

*V-3 ____C ____NC

Chemistry 151
Worksheet 14

Name: _____

- *A. (2.0 pts.) A solution prepared by dissolving 2.00g of an unknown nonvolatile, nonelectrolyte in 10.0g of water has a freezing point of -3.72°C . (k_f for water is 1.86°C/m) Determine the molecular weight of this substance.
- B. A solution is prepared by dissolving 20.0g of urea, NH_2CONH_2 , in 80.0g water. The density of the resulting solution is 1.05g/mL . (At. Wt. C=12.0, H=1.0, N=14.0, O=16.0amu)
- (2.0 pts.) Determine the normal boiling point and freezing point of this solution. For water, $k_f = 1.86^{\circ}\text{C/m}$ and $k_b = 0.512^{\circ}\text{C/m}$.
 - (2.0 pts.) Calculate the vapor pressure of water for this urea solution at 25°C . The vapor pressure of water at 25.0°C is 23.8mm(Hg) .
 - (2.0 pts.) Determine the osmotic pressure of this urea solution at 25.0°C .
- C. (2.0 pts.) A solution prepared by dissolving 0.900g of an unknown substance in sufficient water to give 300mL of solution has an osmotic pressure of 38.4mm(Hg) at 27.0°C . Determine the molarity of this solution and the molecular weight of this substance.