

Chem 1062

Note Title

7/14/2008

* Exams will be scored as quickly as possible.
I will try my best to complete them by tomorrow, but will make no promises. If completed, I will try posting them to D2L.

Tutoring Hours

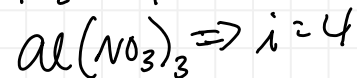
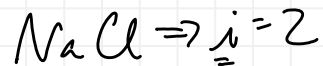
* see schedule posted for available hours

Any Questions?

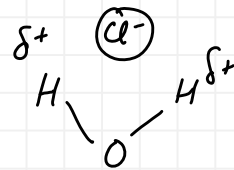
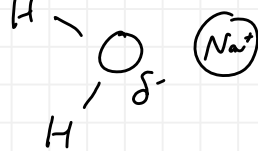
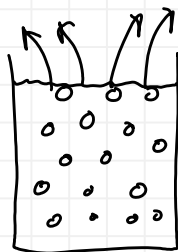
Colligative Properties of Solutions

* properties of solutions that depend only on the concentration of solute particles, and not on their identity

- 1) Freezing Point Depression
- 2) Boiling Point Elevation
- 3) Vapor Pressure Depression
- 4) Osmotic Pressure Elevation

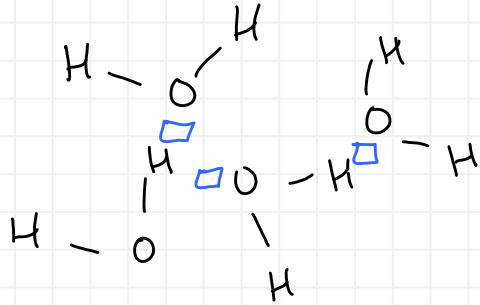


B.P. Elevation / V.P. Depression



F.P. Depression

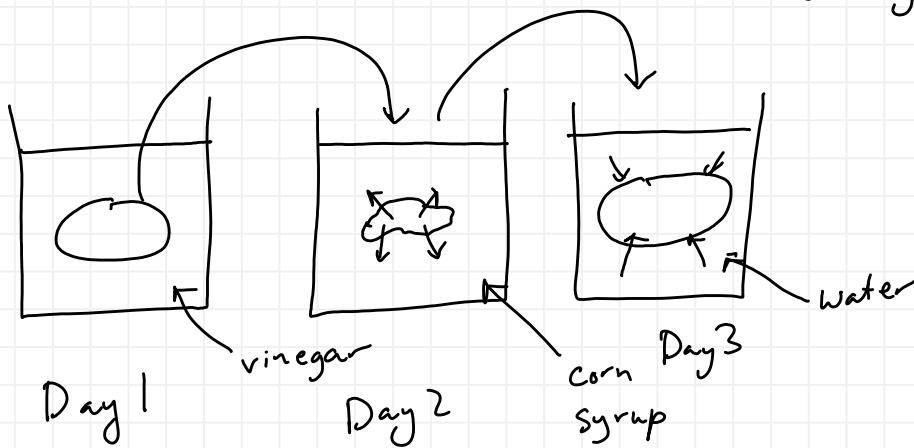
□ = solute



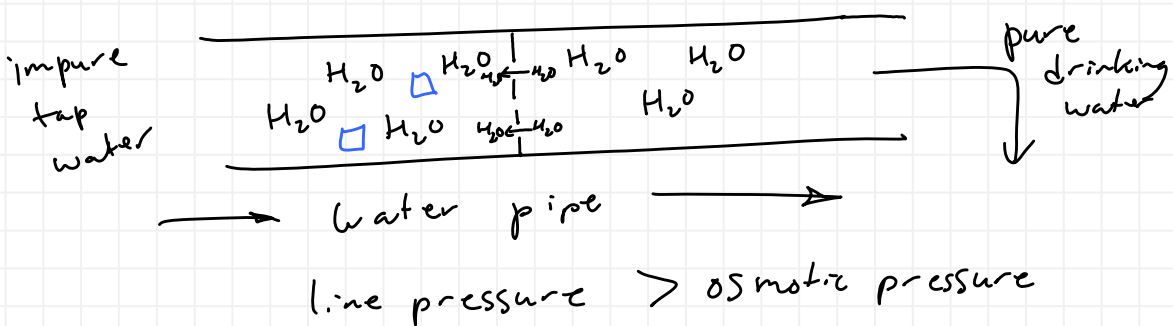
Osmotic Pressure Elevation

* Osmosis - movement of water across a semipermeable membrane from areas of low solute concentration to areas of high solute concentration

Raw Egg in Shell, vinegar, corn syrup (honey)



reverse osmosis



Boiling Point Elevation & Freezing Point Depression

* work with these two on a quantitative basis

$$\Delta T_b = i K_b C_m$$

$$\Delta T_f = i K_f C_m$$

i : vant Hoff factor

C_m : molal concentration

K_b : b.p. elevation constant K_f : f.p. depression constant

↑ function of solvent,
not the solute

Find the b.p. of a solution that contains 50.0 g of $C_6H_{12}O_6$ in 1000 g H_2O .

Find its f.p.

$$K_b = 0.512^\circ C/m \quad K_f = 1.858^\circ C/m$$

$$\Delta T_b = i K_b C_m$$

$$\Delta T_f = i K_f C_m$$

$$C_m = 50.0 \text{ g } C_6H_{12}O_6 \times \frac{1 \text{ mol } C_6H_{12}O_6}{180.2 \text{ g } C_6H_{12}O_6} \times \frac{1}{1.000 \text{ kg } H_2O}$$

$$= 0.2775 \text{ m } C_6H_{12}O_6$$

$$\Delta T_b = \cancel{x} (0.512^\circ C/\cancel{m}) (0.2775 \cancel{m})$$

$$= 0.142^\circ C$$

$$\text{b.p.} = 100.000^\circ C + 0.142^\circ C = \boxed{100.142^\circ C}$$