(44) (b)

$$\frac{\text{Moles AA} \quad \frac{80.5}{176}}{\text{Moles AA + Moles } H_2O} = X_{AA}$$

$\left(\frac{g}{MW}\right) = \text{Mole}$

$$\frac{\frac{80.5}{176} + \frac{210}{18}}$$

(d) $M = \frac{\text{Moles AA}}{l \text{ of soln}} = \frac{0.457 \text{ mole AA}}{}$

$d = 1.22 \text{ g/mL}$

$\dfrac{1 \text{ mL} \quad | \quad 290.5 \text{ g}}{1.22 \text{ g} \quad |} =$

(SDS)   1.5 l   ~~0.110M~~ $(NH_4)_2 SO_4$ find g $(NH_4)_2 SO_4$

$\dfrac{0.110 \text{ moles } (NH_4)_2 SO_4}{1 \text{ l soln}}$

$\dfrac{0.110 \text{ moles } (NH_4)_2 SO_4}{1 \text{ l}} \quad \bigg| \quad 1.5 \text{ l} \quad \bigg| \quad \dfrac{132 \text{ g} (NH_4)_2 SO_4}{1 \text{ mole } (NH_4)_2 SO_4} = 21.78 \text{ g} (NH_4)_2 SO_4 \text{ in } 1.5 \text{ l}$

Factors That affect Solubility

① Temp   ⓐ Solids → As T ↑, Sol ↑
(Avg K.E.)
          ⓑ gases → As T ↑, sol ↓

② Pressure → GASES

③ Concentration (M) or [ ] → As [ ] ↑, Sol Slows down.

④ Bond types   Polar Solvent → Polar + Ionic Solute

        Non-Polar Solvent → N.P. Solutes.

Jan 8-8:07 AM

Henry's LAw

Solubility of Gas = K Partial Pressure of GAS

Sol. Constant.

$C_{(g)} = K P_{(g)}$

Jan 8-8:13 AM

Colligative Properties

¿ What happens when you add <u>Solute</u> to a <u>Solvent?</u>

	FP	BP
① Pure H_2O	0°C	100°C
1m $NaCl_{(aq)}$	~ -4°C	~ 102°C
2m $NaCl_{(aq)}$	~ -8°C	~ 104°C

Made up #'s

Jan 8-8:21 AM

Why ΔT with ↑m?

<u>Boiling</u>

Pure ① H_2O Hot

Not as Hot
↑ Condenser
Hot

90°C FLAME

Superheated H_2O happen transfers heat up.

Boil　　　VP ≥ Patm

Hot
Hot
100°C

$NaCl_{(aq)}$　　　NaCl

Jan 8-8:42 AM

Colligative Prop → Add a solute to a solvent

① BP ↑
② FP ↓
③ VAPOR PRESSURE (the one going up) ↓
  ↳ DECREASES!
④ Osmotic Pressure → increases ↑
  ↳ RAOULT'S LAW

Jan 8-8:51 AM

Raoult's Law → OSMOTIC P.

$$P_A = X_A P_A^{\circ}$$ ← PURE

Vapor Pressure of Solution =
Solute + Solvent
"Salt Water"

mole fraction of the SOLVENT
Solvent

→ Vapor pressure of Pure Solvent
NO solute present.
"Water"
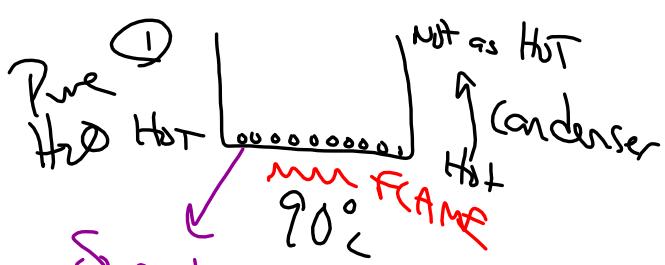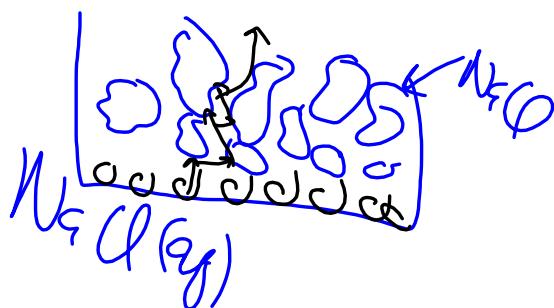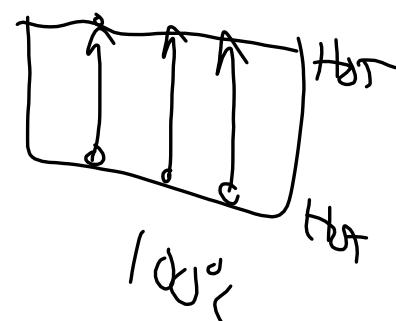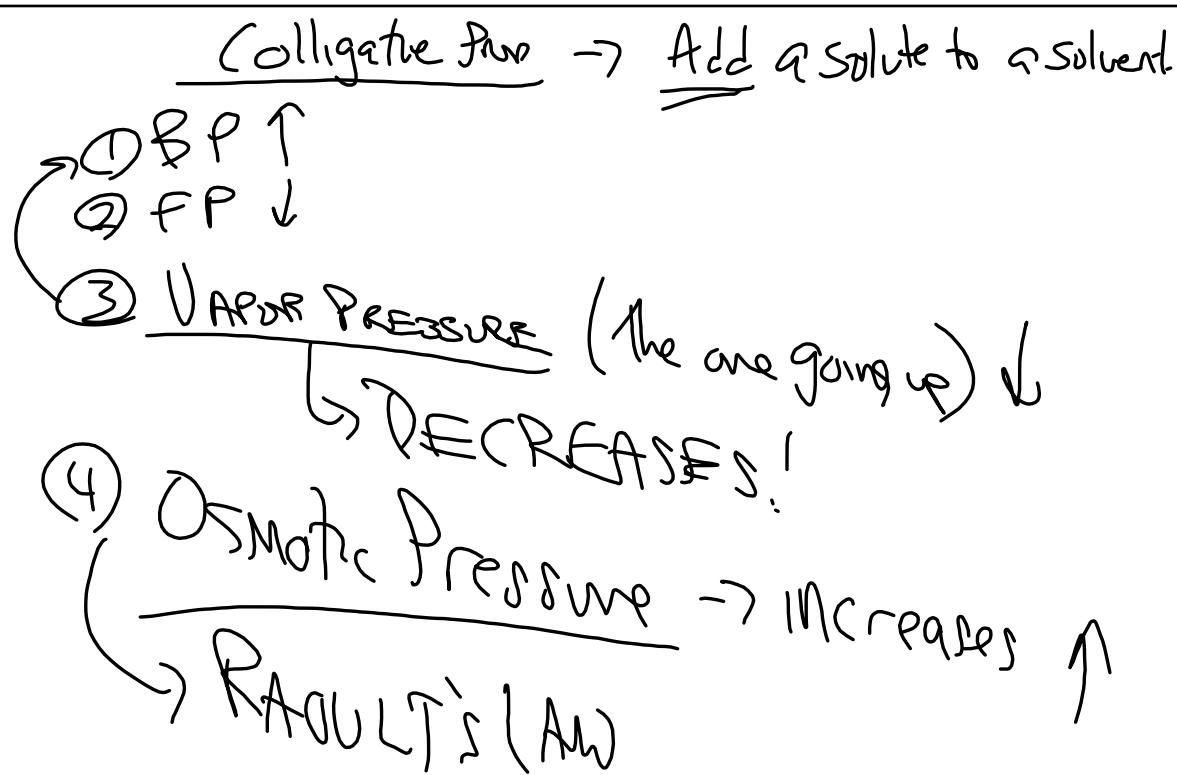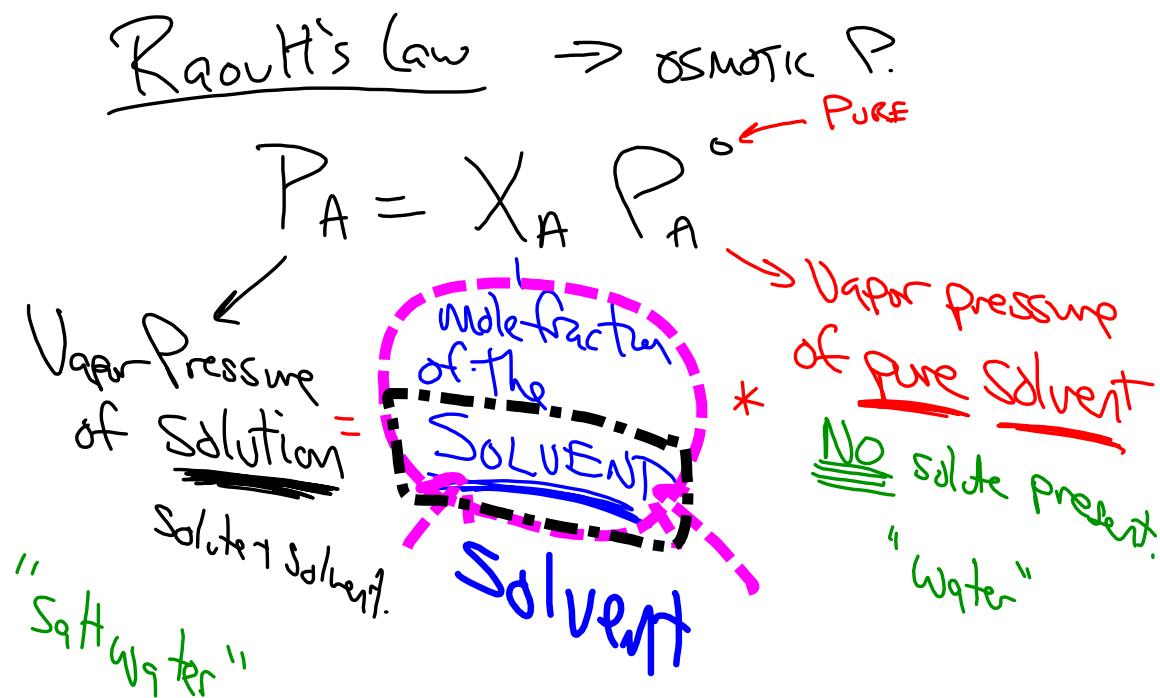
Jan 8-8:57 AM

Glycerine $C_3H_8O_3$ $d = 1.26 g/mL$

Calc VP at 25°C for a solution

50 mL glycerine + 500 mL H_2O

VP Pure H_2O @ 25°C = 23.8 torr

$VP_{soln} = X_{solvent} P_{pure\ solvent}$

$VP_{soln} = (0.976)(23.8\ torr) = 23.2\ torr$

Jan 8-9:02 AM

$X_{solvent} = \dfrac{Moles\ H_2O}{Moles\ glycerine + Mole\ H_2O} = 0.976$

27.8 (Moles H_2O)

0.684   27.8

$\dfrac{50\ mL\ glyc \mid 1.26g\ glyc \mid 1\ mole}{\qquad\qquad 1\ mL\ glyc \mid 92.1g} = 0.684\ mole\ glyc$

$\dfrac{500\ mL \mid 1g \mid 1\ mole}{\qquad 1\ mL \mid 18g} = 27.8\ mole\ H_2O$

Jan 8-9:06 AM

Osmotic Pressure (π)

$$\pi = MRT$$

$$\boxed{PV = nRT}$$

$$P = \frac{n}{V} RT$$

$$P = MRT$$

$$\boxed{\pi = MRT}$$

Jan 8-9:11 AM

Change in BP/FP Temp

$$\Delta T = (K * M) \, i \quad \leftarrow \text{\# of ions in soln.}$$

Change in T

constant for each substance

Molality

BP + ΔT

FP − ΔT

$$\frac{H_2O}{}$$

$$K_b = 0.52°/M$$

$$K_A = 1.86°/M$$

Jan 8-9:12 AM