

$$\frac{571.6 \text{ g H}_2\text{SO}_4}{1 \text{ l solution}}$$

$$D = \frac{1.329 \text{ g soln}}{1 \text{ cm}^3}$$

$$\text{cm}^3 = \text{ml}$$

$$\text{Mass } \% = \frac{\text{Part}}{\text{Whole}} \times 100 = \frac{571.6 \text{ g}}{1329 \text{ g}} \times 100 = 43.01\%$$

1.329 g	1000 ml	=	1329 g soln H ₂ SO ₄ + H ₂ O
1 ml	1000 ml	-	571.6 g H ₂ SO ₄ - H ₂ SO ₄
			757.4 g H ₂ O

Jan 15-7:22 AM

$$X = \frac{\text{mole H}_2\text{SO}_4}{\text{mole H}_2\text{SO}_4 + \text{mole H}_2\text{O}} = \frac{5.83}{5.83 + 42.06} \quad (0.122)$$

$$\frac{571.6 \text{ g H}_2\text{SO}_4}{98 \text{ g H}_2\text{SO}_4} = 5.83 \text{ mole H}_2\text{SO}_4$$

$$\frac{757.4 \text{ g H}_2\text{O}}{18 \text{ g H}_2\text{O}} = 42.08 \text{ mole H}_2\text{O}$$

Jan 15-8:15 AM

$$c) m = \frac{\text{Moles Solute}^{\text{H}_2\text{SO}_4}}{\text{kg Solvent}^{\text{H}_2\text{O}}} = \frac{5.83 \text{ Moles}}{0.7574 \text{ kg}} = \boxed{7.7 \text{ m}}$$

$$d) M = \frac{\text{Moles Solute}}{\text{l of soln}} = \frac{5.83}{1} = \boxed{5.83 \text{ M}}$$

Jan 15-8:19 AM

Colligative Properties (Add solute to solvent)

① BP ↑

③ Vapor Pressure ↓ = $X_{\text{Solvent}} P^{\circ}_{\text{Pure solvent}}$

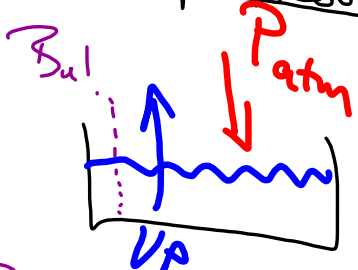
② FP ↓

④ Osmotic Pressure ↑

$\Pi = MRT$
 $PU = nRT$

Raoult's Law

Vapor Pressure $UP \geq P_{atm}$ Boiling



$VP_A = X_A P_A^{\circ}$

Vapor Pressure of the Solution

Mole Fraction of Solvent

← Pure Solvent Pressure

← Pure Solvent

Jan 15-8:22 AM

Glycerine $C_3H_8O_3$ (Non-volatile / Non-electrolyte)
 $D = \frac{1.26g}{ml}$ at $25^\circ C$

Find VP at $25^\circ C$
 50ml $C_3H_8O_3$ + 500ml H_2O

VP_{soln} = X_{solvent} $P^\circ_{\text{pure solvent}}$

$23.23 \text{ torr} = (0.976) (23.8 \text{ torr})$

H_2O $25^\circ C$
 $P_{H_2O} = 23.8 \text{ torr}$
 $D = 1g/ml$

Not breaking up into ions!

$X_{H_2O} = \frac{\text{Mole } H_2O}{\text{Mole } H_2O + \text{Mole } C_3H_8O_3}$

$= \frac{27.78 \text{ mole } H_2O}{27.78 \text{ mole } H_2O + 0.685}$

$X_{H_2O} = 0.976$
 $X_G = 0.024$

500ml H_2O	1g
500g H_2O	1m
50g H_2O	1mole
	18g
27.78 mole H_2O	

50ml G	1.26g	63g
	ml	
63g	1mole G	0.685
	98g	mole G

Jan 15-8:30 AM

Osmotic Pressure (Π)

$PV = nRT$

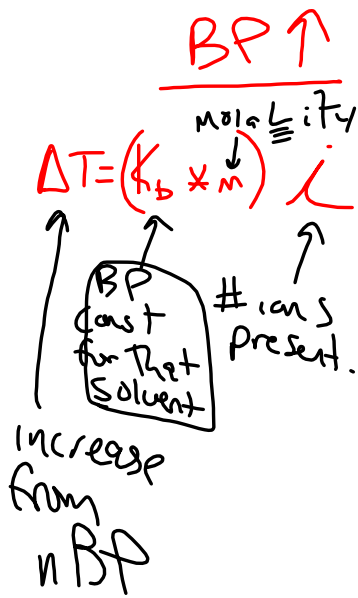
$P = \frac{n}{V} RT$

$P = M RT$

$\Pi = M RT$

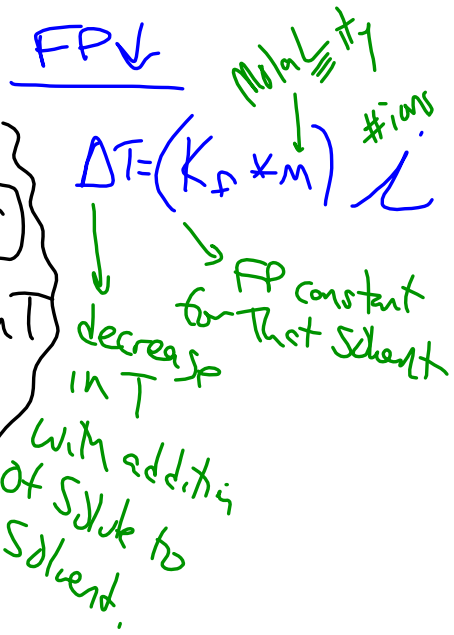
Chap 13
 Soln Chem
 M, m,

Jan 15-8:42 AM

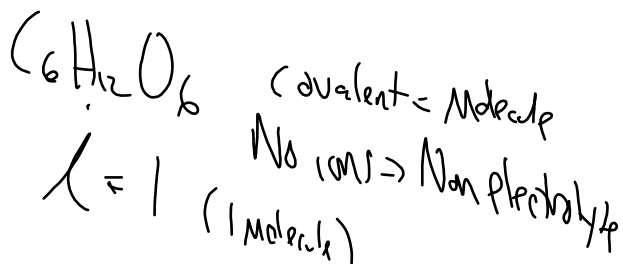
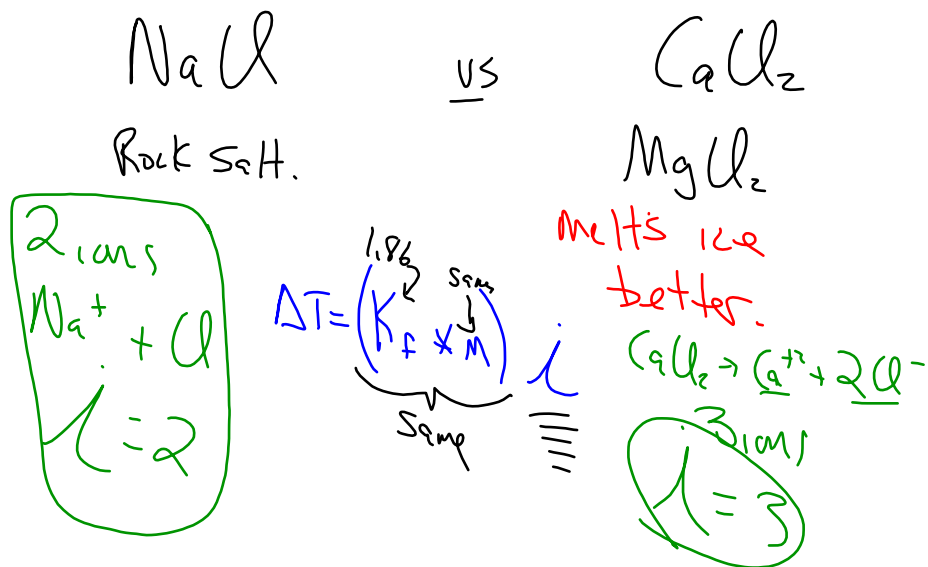


↑/↓ from normal BP/FP of that solvent

ΔT = change in T



Jan 15-8:52 AM



Jan 15-8:59 AM

13.62 g Find VP 32.5g $C_3H_8O_3$
glycerine

$$VP = X_{\text{solvent}} P^{\circ}_{\text{Pure solvent}}$$

$$VP = (0.95)(233.7 \text{ torr})$$

$$= 222.38 \text{ torr}$$

125g H_2O at 343K

70°C

233.7 torr

P IIII
App (P)

$$X_{\text{H}_2O} = \frac{\text{Mole H}_2\text{O}}{\text{Mole G} + \text{Mole H}_2\text{O}} = \frac{\frac{125}{18}}{\frac{32.5}{92} + \frac{125}{18}} = 0.95$$

solvent!

Jan 15-9:08 AM

13.73 44.2mg Aspirin. $C_9H_8O_4$
in 0.358L H_2O at 25°C = 298K

Find OSMOTIC Pressure

$$PV = nRT$$

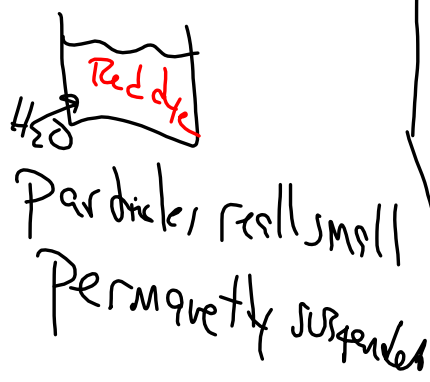
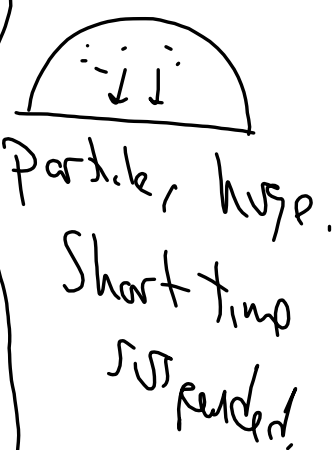
$$PV = \frac{g}{MW} RT$$

$$P = \frac{\frac{g}{MW} RT}{V}$$

$$P = \frac{(\frac{44.2 \times 10^{-3}}{180})(0.08206)(298)}{0.358 \text{ L}}$$

$$P = 0.0168 \text{ atm}$$

Jan 15-9:21 AM

<p><u>Solution</u></p> <p>Solute never settles out.</p> 	<p><u>Colloid</u></p> <p><u>Dust</u> in the air settles slowly.</p>	<p><u>Suspension</u></p> <p><u>Snow Globe</u></p> 
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Jan 15-9:26 AM

HW PS 13

#5 Pick a mass

Skip # 3, 9, 11, 19, 21

Jan 15-9:31 AM