13.43 571.6g H_2SO_4, 1329g / ml (soln)

ⓐ Mass %
ⓑ X
ⓒ m
ⓓ M

ml = cm^3

solute + solvent

$$\frac{\text{Mass } H_2SO_4}{\text{Total Mass (solution)}} = \frac{571.6\text{g}}{1329\text{g}} \times 100 = 43\%$$

$$\frac{1.329\text{g}}{\text{ml}} \times \frac{1000\text{ml}}{1\text{l}} = 1329\text{g soln}$$

Total Mass Soln

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ⓑ Mole fraction

$$\frac{\text{Moles } H_2SO_4}{\text{Total moles}} = 0.122$$

5.83 / Total moles

Mole H_2SO_4: 5.83

Mole H_2O: 42.08

571.6g H_2SO_4 | mole H_2O

98g H_2SO_4

5.83 mole H_2SO_4

In 1 liter

1329g − 571.6g = 757.4g H_2O

757.4g | 1mole

18g 42.08 mole H_2O

57.4g Water

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(c) $m = \frac{\text{moles } H_2SO_4}{\text{kg water}} = \frac{5.83}{0.7574\ \text{kg}} = 7.7\ m$

(d) $M = \frac{\text{moles } H_2SO_4}{\text{L soln}} = \frac{5.83}{1} = 5.83\ M$

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50b) 120 g soln, 0.65 m Na_2CO_3

$\frac{0.65\ \text{mole } Na_2CO_3}{\text{kg water}}$ ← 68.9 g Na_2CO_3

$\frac{68.9\ \text{g } Na_2CO_3}{1000\ \text{g } H_2O}$ → 1068.9 g soln (solute + solvent)

$\frac{68.9\ \text{g}}{1068.9\ \text{g soln}} = \frac{x\ \text{g}}{120\ \text{g soln}}$

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SOL 1.20 L soln, 15% $Pb(NO_3)_2$ by mass, 1.16 g/mL soln

$$\frac{1.16\ g}{mL} * \frac{1200\ mL\ soln}{1} = 1392\ g\ soln$$ → solute + solvent

15% of total

$$0.15(1392) = 208.8\ g\ PbNO_3$$

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Colligative Properties

What happens when you add a solute to a pure solvent

Ex Add salt to water

① Boiling Point (STP)

Pure water: BP = 100°C

HOT GETS HOTTER

BP salt water solution ($NaCl_{(aq)}$) > 100°C

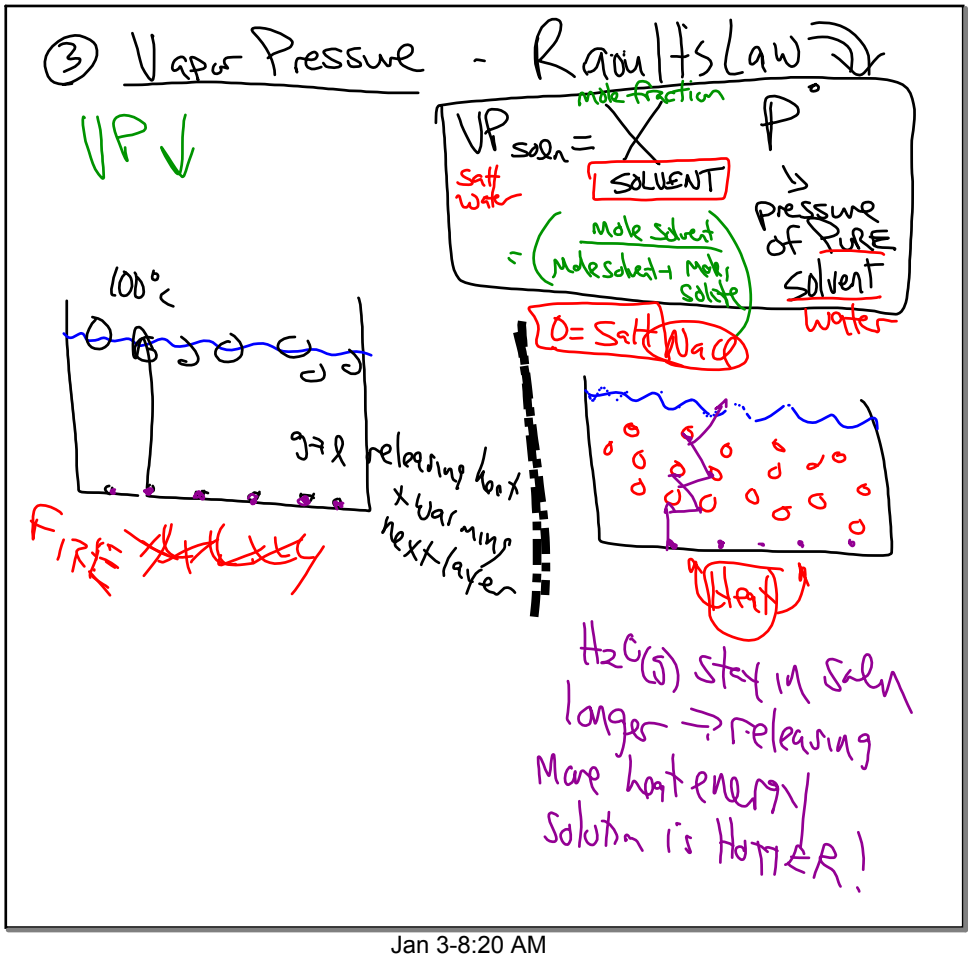
② Freezing Point

Normal FP H_2O = 0°C

COLD gets colder

FP salt water soln < 0°C

Jan 3-8:12 AM



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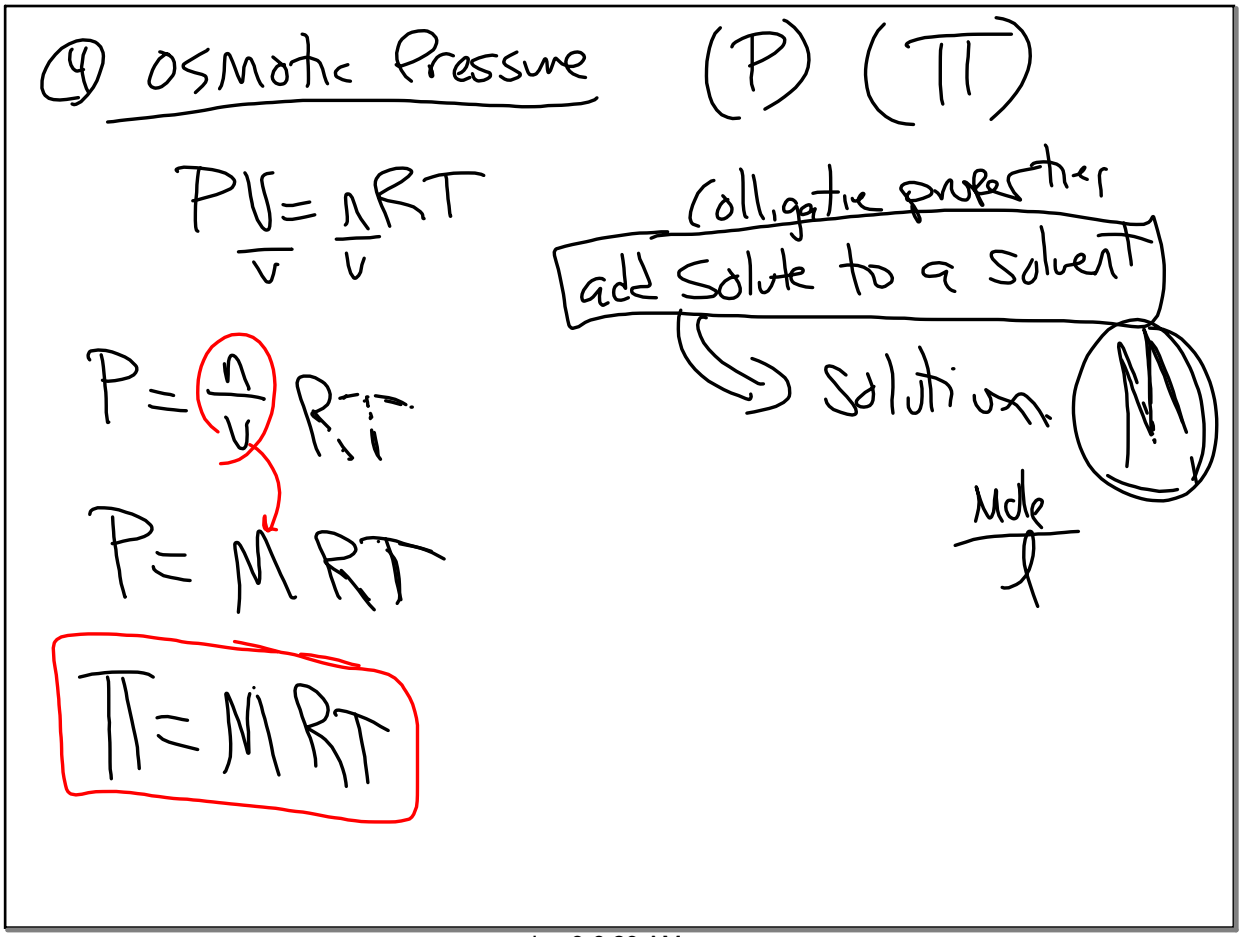

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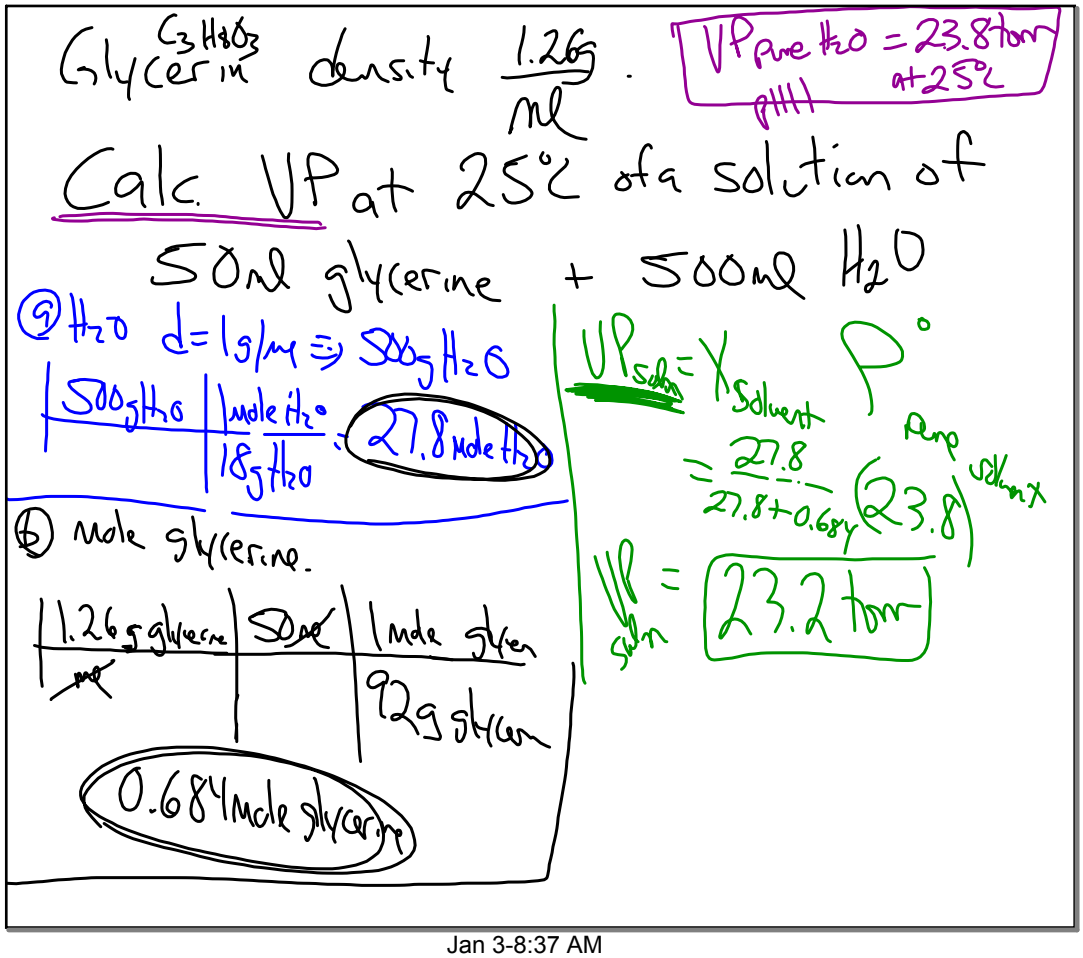

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13/ 62a, 73

Jan 3-8:46 AM