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Physical Chemistry 2nd YUGS_EV_ST

Name of a student

صابرينه محمد زهير

Signature

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No.

AB

Mustansiriyah University
Department of Chemistry

2nd SEM-2026 Bologna Process
Mid Exam Class A Paper A

Q1/MCO test (Answer the following)

(Marks 50 %)

1: Depression of freezing point of a solution associated an increasing in?

Answer: a) T b) H c) μ d) S

2: When applying the reduced phase rule to condensed systems, the pressure is assumed to be ----- atm?

Answer: a) zero b) 1 c) 2 d) 3

3: The reduced phase rule applies when which variable is kept constant?

Answer: a) T b) conc c) p d) χ

4: Which One of the following expressions represents a negative deviation from Raoult's law?

Answer: a) $P_A^* \neq \chi_A P_A$ b) $P_A = \chi_A P_A^*$ c) $P_A > \chi_A P_A^*$ d) $P_A < \chi_A P_A^*$

5: Addition of a non-volatile solute to a pure solvent results in a change in?

Answer: a) $\Delta_{mix}H$ b) $\Delta_{mix}S$ c) $\Delta_{mix}V$ d) all of these

6: The difference between pure and impure solvent is?

Answer: a) $\mu^* = \mu$ b) $\mu^* > \mu$ c) $\mu^* < \mu$ d) $\mu^* \neq \mu$

7: The relationship between ΔT_f and χ_B is?

Answer: a) direct b) inverse c) disordered d) none of these

8: With the two-component system (A & B), one part of the solid phase consists of?

Answer: a) A + B b) A + solution c) B + solution d) A + eutectic

9: If you add a solute to a pure solvent, then there is a decrease in the ----- of the solution.

Answer: a) S b) H c) T d) μ

10: Dalton's law is used to calculate the partial pressure of which phase?

Answer: a) liquid b) gas c) solid d) plasma

Q2 A solution contains 4.0 g of an unknown substance in 0.5 dm³ of solution. Its osmotic pressure is

103 torr at 34.0 °C. Calculate the molar mass of the unknown substance.

(Marks 25%)

Q3 Using the diagram below and the appropriate phase rule, fill in all the blanks and determine the composition of the all-eutectic mixture, all equilibria, all reversible and irreversible processes, and the name of the regions located to the right and left of points C, E & AB?

(Marks 25%)



Name of a student _____ Signature _____ No. _____

Q2

Sol

$\pi = [B] R T$

$0.13 \text{ atm} = \frac{4 \text{ g}}{0.5 \text{ L} \times M.wt} \times 0.082 \text{ atm} \cdot \text{L} \cdot \text{mol}^{-1} \cdot \text{K}^{-1} \times 307 \text{ K}$

$0.135 = \frac{100.696 \text{ g/mol}}{500 \times M.wt}$

$M.wt = \frac{100.696 \text{ g}}{6.5 \text{ mol}}$

$= 15.49 \text{ g/mol}$

$= 15.49 \text{ g/mol}$

Q2 15/25

$\pi = \frac{103 \text{ torr} \times 1 \text{ atm}}{760 \text{ torr}} = 0.13 \text{ atm}$

$= 0.13 \text{ atm}$

$V = 0.5 \text{ dm}^3$

$= 0.5 \text{ L}$

$P = \frac{n}{V} \times R T$

$P = \frac{4 \text{ g}}{0.5 \text{ L} \times M.wt}$

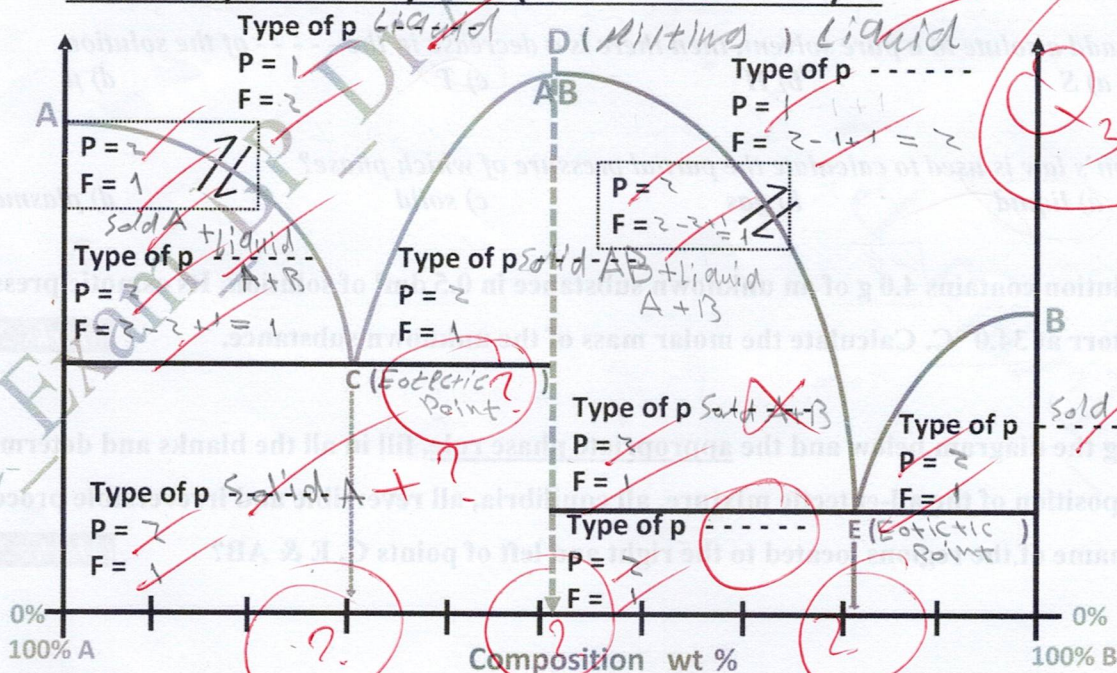
$wt = 4.0 \text{ g}$

$T = 34^\circ\text{C} + 273$

$= 307 \text{ K}$

Q3

Two component system



Q3 10/25