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Date
Physical_Chemistry_2nd_YUGS_EV_ST

Name of a student

Signature

Signature

No. 18

Mustansiriyah University
Department of Chemistry

2nd SEM-2025_Bologna_Process
Mid_Exam_Class_A_Paper_C

Q1/MCQ test (Answer the following)

(Marks 50 %)

1: Depression of freezing point of a solution means increasing in?

Answer: a) T b) H c) μ

0.5

2: If you apply the reduced phase rule to condensed systems, then the expected value of pressure is -----?

Answer: a) zero b) 1

0.2

d) 3

3: The reduced phase rule can be applied when the number of components is -----?

Answer: a) zero b) 1

0.2

d) 3

4: Which One of the following formulas represents the right equation of 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 the pure solvent causes 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 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 ----- phase?

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

Q2: The Π of a solution containing 4.0 g of an unknown substance per 0.5 dm^3 of solution is 10^3 torr at

34.0 °C. Find the molar mass of this unknown.

(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 _____

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$$\cancel{Q_2} \quad \cancel{\lambda = RT \ln(B)} \Rightarrow [B] = \frac{\cancel{\lambda}}{RT}$$

$$[B] = \frac{1.3157 \text{ atm}}{0.082 \text{ atm/L} \cdot \text{K} \cdot \text{mol} \times 307 \text{ K}}$$

$$Q_2 \quad \frac{20}{25}$$

$$Wt(A) = 4.0 \text{ g}$$

$$\lambda = 10^3 \text{ L} \cdot \text{mol} \cdot \text{K}^{-1} \cdot \text{Pa} = 760$$

$$\lambda = 1.3157 \text{ atm}$$

$$T = 34.0 + 273$$

$$= 307 \text{ K}$$

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

$$= \frac{0.0005}{0.082} \text{ L} = 0.0061 \text{ L}$$

$$R = 0.082 \text{ atm} \cdot \text{dm}^3 \cdot \text{K}^{-1} \cdot \text{mol}^{-1}$$

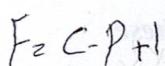
$$= \frac{1.3157}{25.174} \Rightarrow [B] = 0.0522 \text{ mol/L}$$

$$\text{No. of molar} = [B] \cdot V$$

$$= 0.0522 \text{ mol/L} \times 0.0005 \text{ L} \Rightarrow \text{No. of molar} = 0.000261 \text{ mol}$$

$$\text{Molar mass} = \frac{Wt}{\text{No. of molar}} = \frac{4.0 \text{ g}}{0.000261 \text{ mol}}$$

$$\text{Molar mass} = 1532.567 \text{ g/mol}$$



Two component system (نظام اثنين المكونات)

