



Mid Quiz
 3/5
 فاطمة حسن زهير

Physical_Chemistry_2nd_YUGS_EV_ST

40/100
 Fourth only
 37

Name of a student

فاطمة حسن زهير

Signature

No. 37

Mustansiriyah University
 Department of Chemistry

2nd SEM-2025 Bologna Process
 Mid_Exam_Class_B_Paper_A

Q1/MCO test (Answer the following)

(Marks 50 %)

1: The reduced phase rule is interested in two variants?

- Answer: a) $p & T$ b) $F & T$ c) $p & conc.$ d) $T & conc.$

2: Ideal solution follows ----- law.

- Answer: a) Raoult's b) Trouton's c) Henry's law d) Van't Hoff's law

3: The three phases of H₂O in the phase diagram meets?

- Answer: a) at 1 atm b) over 1 atm c) below 1atm d) at any pressure

4: Liquid solution of HNO₃ is formed from?

- Answer: a) 1 C b) 2 C c) 3 C d) 4 C

5: How many phases are there when the number of variants is zero and the number of components is one?

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

6: The Clausius-Clapeyron equation can be applied when there is an equilibrium between one of the following?

- Answer: a) L & L b) S & L c) G & L d) S & S

7: One of the following formulas represents the right equation of Henry's law?

- Answer: a) $P_A = \chi_A P_A^*$ b) $P_A > \chi_A P_A^*$ c) $P_A < \chi_A P_A^*$ d) none of these

8: Molality is used to calculate the molar mass of the?

- Answer: a) non-volatile solute b) pure solute c) pure solvent d) solution

9: Osmosis pressure exerts when the solvent transfers to the?

- Answer: a) volatile solute b) non-volatile solute c) pure solvent d) solution

10- One of the most important benefits of measuring ΔVP , ΔT_b , ΔT_f and $\Delta \Pi$ is to calculate ----- of B?

- Answer: a) M b) m c) V d) p

Q2/ The vapor pressure (VP) of a substance is 30 torr at 250 K. At what temperature will the substance have VP of 150 torr? $\Delta_{vap}H$ is 45 kJ mol⁻¹ (Marks 25%)

Q3/ Plot the phase diagram of the system (A & B) assumed that (A & B) do not react with each other. A freezes at (-5 °C) and B freezes at (7 °C), and that an eutectic mixture is formed when the ratio is 70 wt % of A and that the eutectic melts at (-10°C), then label all the parts (p & F) of the diagram? (Marks 25%)

$$\Delta_{\text{vap}}H = 45 \text{ kJ mol}^{-1}$$

$$P_i = 30 \text{ torr}$$

$$T_i = 250 \text{ K}$$

$$T_f = ?$$

$$P_f = 150 \text{ torr}$$

$$\frac{45 \text{ kJ} \times 1000}{1000} = 0.045 \text{ J}$$

$$\frac{45000}{1000}$$

~~$$\ln \frac{P_f}{P_i} = \frac{\Delta_{\text{vap}}H}{R} \left(\frac{1}{T_f} - \frac{1}{T_i} \right)$$~~

~~$$\ln \frac{150 \text{ torr}}{30 \text{ torr}} = \frac{45000 \text{ J mol}^{-1}}{8.314 \text{ J K}^{-1} \text{ mol}^{-1}} \left(\frac{1}{T_f} - \frac{1}{250 \text{ K}} \right)$$~~

~~$$1.6 = 5411 \left(\frac{1}{T_f} - \frac{1}{250 \text{ K}} \right)$$~~

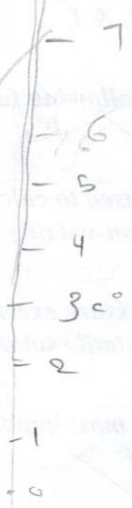
$$Q_2 \frac{10}{25}$$

Q3/



solid

$$Q_3 \frac{\text{zero}}{25}$$



100%
A 0% 10%

B 100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%

B 0%