Mid & Quize

Physical_Chemistry_2nd_YUGS_EV_ST

Name of a student ---------- Signature ---------- No. 5

Mustansiriyah University
Department of Chemistry

2nd SEM-2025_Bologna_Process
Mid_Exam_Class_B_Paper_A

Q1/ MCQ 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 H_2O 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 HNO_3 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) n

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%)

Q2/

$\Delta H = 45\ KJ\ mol^{-1}$

$T_i / 250\ K$

$P_f / 30\ torr$

$P_i / 150\ torr$

$T_f / ?$

$R / 8.314\ KJ\ mol$

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

Ln ?= units

$\ln \frac{150\ torr}{30\ torr} = \frac{45 \times 10^{3}\ J\ mol^{-1}}{8.314 \times 10^{-3}\ J\ mol} \left(\frac{1}{T_f} - \frac{1}{250} \right)$

$\ln 5 = 541255 \times 10^{3} \left(\frac{1}{T_f} - \frac{1}{250} \right)$

$T_f = 5 = 541255 \times 10^{3} (250)$

$T_f = 5 (135.3)$

$T_f = \boxed{676.5}$

$Q_2 \frac{10}{25}$

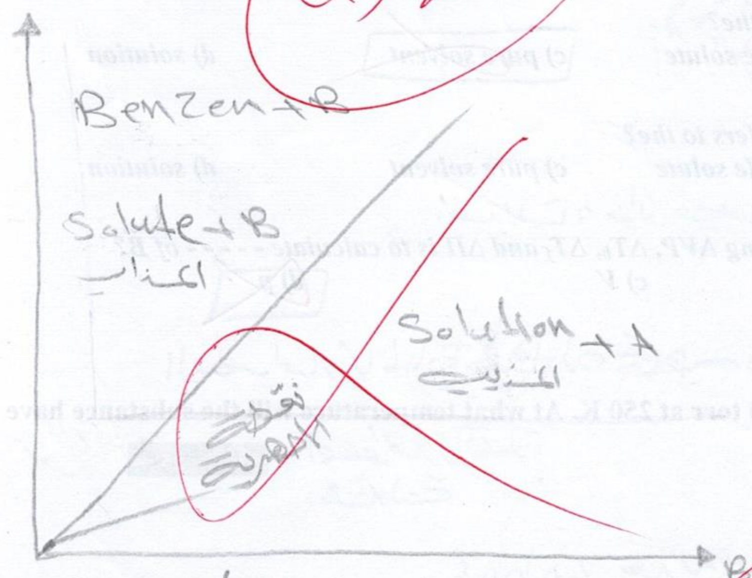
Q3/

تعريف قانون

$\frac{dP}{dT} = \frac{\Delta S_m}{\Delta V_m}$

$\frac{dP}{dT} = \frac{\Delta H vap}{Vm\ gm - Vm\ (L)}$

$Q_3 \frac{zero}{25}$



تعريف الاطوار $\boxed{P+F=C+2}$

عدد مكونات الطور وتركيب ثابت تكون مواد في الاطوار في حالة ثابت وتتم تغيرات هذه حولت فيتغير احد هذه الاطوار.

تعتمد على الطور وتتغير الدرجات وتتم تغيرها عن الحالة صورة الحالات البرامترية

$\frac{70}{100} = \frac{A}{30} \times 100 = 21.9$

$\frac{21.9}{100} = \boxed{0.021} = A$

$B\% = \frac{30}{100} \times 100 = \boxed{30\%}\ B$

70% A B

30%