Physical_Chemistry_2nd_YUGS_EV_ST

Name of a student ---------- Signature ---------- No. B13

Mustansiriyah University
Department of Chemistry

2nd SEM-2026_Bologna_Process
Mid_Exam_Class_A_Paper_B

Q1/ MCQ test (Answer the following) (Marks 50 %)

1: Which two variables does the Gibbs phase rule consider as independent??
Answer: a) p & T b) F & T c) p & conc. d) T & conc.

2: If NaCl is added to ice, which property of the solution decreases?
Answer: a) LP b) VP c) FP d) BP

3: At what pressure do the three phases of CO_2 coexist in the phase diagram?
Answer: a) at 1 atm b) over 1 atm c) below 1atm d) at any pressure

4: Which phase corresponds to a supercooled substance?
Answer: a) gas b) liquid c) solid d) plasma

5: How many phases are present when a one-component system has two degrees of freedom?
Answer: a) zero b) 1 c) 2 d) 3

6: The Clausius equation can be applied to which of the following phase equilibria?
Answer: a) melt. & freez. b) frees. & melt. c) vap. & cond. d) all of these

7: What is the relationship between the VP of a solution and the solute molality?
Answer: a) direct b) inverse c) disordered d) none of these

8: Which type of solute, when added to a solvent, alters its colligative properties?
Answer: a) non-volatile solute b) volatile solute c) pure solute d) pure solvent

9: In osmosis, the solvent moves toward which component?
Answer: a) solute b) impure solute c) mixture d) pure solvent

10- One of the most important applications of measuring molar mass of the solute is to study the change in - - - .
Answer: a) m b) Π c) V d) p

Q2/ **0.5 mol of a non-P-solute was added to 12.0 mol of P-solvent, VP^* is 12.0 kPa at 295 K. What is the VP at 295 K? Determine the deviation of this solution from Raoult's law where VP_{ideal} = 10 kPa.** (Marks 25%)

Q3/ **Plot the phase diagram of the system (α and β) assumed that (α and β) do not react with each other. α freezes at (− 7 °C) and β freezes at (10 °C), and that a eutectic mixture is formed when the ratio is 30 wt % of β and that the eutectic melts at (− 10 °C), then label all the parts (p & F) of the diagram using the appropriate phase rule?** (Marks 25%)

Q2/ $n_{solute} = 0.5\ mol$, $n_{solvent} = 12\ mol$, $P^* = 12\ kPa$

$T_i = 295\ K$, $T_f = 295\ K$, $V_{ideal} = 10\ kPa$

$P_{الذائب} = ?$ Vapp.

$K_2 = \frac{P_2}{X_3}$

Zero Q_2 25

wrong eq!

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

Q3

Zero Q_3 25