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32 / 100 Thirty two

Physical_Chemistry_2nd_YUGS_EV_ST



Name of a student (A) Signature No. 2

Mustansiriya University Department of Chemistry SEM-2025_Bologna_Process Mid_Exam_Class_A_Paper_A

Q1: Circle the right answer for all of the following (50 Marks)

1: liquefaction of the gas means which of the following? (a) Z = 1 (b) Z > 1 (c) Z < 1 (d) Z ≠ 1

2: In the van der Waals equation, what is the correct formula for the volume of the gas? (a) ni/nT (b) V (c) V/m (d) V/n

3: If a gas has polar particles, then the difference between the volume of this gas is: (a) V_{Real} > V_{Perfect} (b) V_{Real} < V_{Perfect} (c) V_{Real} = V_{Perfect} (d) V_{Real} ≠ V_{Perfect}

4: It can classify the type of reaction within adiabatic process as: (a) reversible (b) isobaric (c) isothermal (d) free expansion

5: If it is required to measure the work done in an isochoric process, the value of work will be: (a) zero (b) one (c) two (d) three

6: In a completely insulated system, the work done is in contact with which of the following? (a) gas (b) system (c) surrounding (d) pressure

7: When the internal pressure of the system is equal to atmospheric pressure, the actual value will be: (a) zero (b) one (c) two (d) three

8: During an isothermal reversible process, the change in temperature of the system is? (a) variable (b) equal to zero (c) 25 °C (d) constant

9: Heat capacity is extensive property while molar heat capacity is ----- property: (a) proportional (b) intensive (c) extensive (d) direct

10: When ΔH = zero, the process is: (a) isobaric (b) isochoric (c) isothermal (d) adiabatic

Q2: Using van der Waals equation, calculate the temperature of 5.0 mol of an unknown gas in a 5.0 L container at 80 bar. Compare this temperature with the value obtained from the ideal gas equation. a = 0.0341 L² atm mol⁻²; b = 0.0237 L mol⁻¹. (25 Marks)

Q3: 1100 J of heat energy was applied to (50 g, 27 g mol⁻¹) of aluminum metal. The temperature increased from 25 °C to 45 °C. Calculate C_{p,m} of aluminum. (25 Marks)

Q2

$n = 5 \text{ mol}$, $V = 5 \text{ L}$, $P = 80$, $T = ?$

~~$PV = nRT$~~

? = Units

~~$80 \times 5 \text{ L} = 5 \text{ mol} \times 0.082 \times T$~~

~~$400 = 0.41 \times T$~~

~~$T = 1000 \text{ K}$~~

Q2 $\frac{7}{25}$

Q2 NO ANSWER WHY?

Q3

Q3

~~$T = 45^\circ - 25^\circ$~~
 ~~$= 20^\circ + 273$~~
 ~~$= 293$~~