



Physical_Chemistry_2nd YUGS_EV_ST



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1st 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) $Z \neq 1$

2: In the van der Waals equation, what is the correct formula for the volume of the gas?

- (a) n_i/n_T (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) $V_{\text{Real}} > V_{\text{Perfect}}$ (b) $V_{\text{Real}} < V_{\text{Perfect}}$ (c) $V_{\text{Real}} = V_{\text{Perfect}}$ (d) $V_{\text{Real}} \neq V_{\text{Perfect}}$

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 $\Delta H = \text{zero}$, 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.

$a = 0.0341 \text{ L}^2 \text{ atm mol}^{-2}$; $b = 0.0237 \text{ L mol}^{-1}$.

(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. $n = 5.0 \text{ mol} / V = 5.0 \text{ L} \rightarrow 5.0 \times 1000 \rightarrow V = 5000 \text{ mL}$
 $P = 80 \text{ Pa} \rightarrow P = 0.8 \text{ atm}$

$PV = nRT$

~~$0.8 \times 5000 = 5.0 \times 0.82 \times T$~~

$T = \frac{4000}{0.41} \Rightarrow T = 0.975 \text{ }^\circ\text{C} \rightarrow 0.975 \times 273$
 ~~$T = 273.975 \text{ K}$~~

Q2 $\frac{5}{25}$

Q3 $T_i = 25 \text{ }^\circ\text{C} \rightarrow 273 + 25 \rightarrow T_i = 298 \text{ K}$

Q3 $\frac{\text{zero}}{25}$

NO ANSWER why?