

Assignment

20/10/2023

B.Sc (PS) III Sem

Heat and thermodynamics

Marks - 08

Submission Date - 27/10/2023

- Q.1 The thermal conductivity and specific heat capacity of a gas at 273 K are $24 \times 10^{-3} \text{ J m}^{-1} \text{ s}^{-1} \text{ K}^{-1}$ and $20.9 \text{ kJ mol}^{-1} \text{ K}^{-1}$ respectively. Calculate the diameter of gas molecules. Take mass of gas molecule as $5.31 \times 10^{-26} \text{ kg}$ and $k_B = 1.38 \times 10^{-23} \text{ J/K}$.
- Q.2 The diameter of the molecules of a gas is $3 \times 10^{-10} \text{ m}$. Calculate the mean free path at STP. Take $k_B = 1.38 \times 10^{-23} \text{ J/K}$.
- Q.3 Explain Maxwell-Boltzmann Law of Distribution of velocities in an ideal gas and its experimental verification.
- Q.4 Calculate the total random kinetic energy of one gram molecule of oxygen at 300 K.

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