

CL26_Q1. Explain the concept of density of states and density of occupied states in metals.

CL26_Q2. Derive an expression for the density of electron states in a metal.

CL26_Q3. Calculate the density of states with energy between 4eV and 4.005eV in copper with Fermi energy of 7.02eV. ($E = 4\text{eV} = 4 \times 1.6 \times 10^{-19} \text{ J}$ and $dE = .005 \times 1.6 \times 10^{-19} \text{ J}$ mass of electron = $9.1 \times 10^{-31} \text{ kg}$)

CL26_Q4. Calculate the density of occupied states, for copper, at an energy level which is 0.026 eV above the Fermi level, at a temperature 300K. Assume Fermi energy of copper as 7eV. (Answer: $3.02 \times 10^{46} \text{ states/m}^3/\text{J}$)

CL26_Q5. The energy states below E_F in the range kT are emptied and probability of occupancy lies between 1 and 0.5. Justify.

CL26_Q6. With suitable plot, explain the dependence of density of states on energy