

SOLID STATE (PYQ) PART-II

1. Explain why Einstein's theory of heat capacity of solid fails to explain the experimental temperature variation of heat capacity in its entirety.
2. Silver is known to crystallize in f.c.c form and the distance between the nearest neighbour atoms is 2.87 \AA . Calculate the density of silver. (Ag=108)
3. Write down the assumptions of Einstein's theory of heat capacity of solids, and indicate which of them were modified by Debye to improve the model.
4. Assuming the Debye heat capacity equation to be applicable, show that the entropy of a perfect solid at very low temperature should be equal to $1/3C_v$, where C_v is the heat capacity at the given temperature.
5. Aluminium crystallizes with a face centered cubic lattice. The inter-ionic distance (shortest) in a unit cell of aluminium is 2.86 \AA . Calculate the density of Al (At. Wt. of Al=27)
6. The density of Lithium metal is 0.53 gcm^{-3} and the separation of the 100 planes of the metal is 350 pm . Determine whether the lattice is fcc or bcc. (At. Wt. of Li=6.941)