

Practice Exercise - 1

Q-1 Show the atomic arrangements in (111) plane of f.c.c structure?

Q-2 Calculate the number of atoms per sq mm in the fundamental planes i) (100), ii) (110), iii) (111) of a simple cubic crystal. Assume 'a' is the lattice constant in mm. & 'r' = radius of atom in mm.

Q-3 The density of α -iron is 7870 kg/m^3 and its atomic weight is 55.8. Given that α -iron crystallizes in bcc-space lattice. Calculate the value of lattice constant. Avogadro number = $6.023 \times 10^{26} (\text{kg mol}^{-1})$.

Q-4 Bragg found that for a KCl crystal, strong reflections from the sets of planes (100), (110) and (111) are obtained for angles $5^\circ 23'$, $7^\circ 27'$, and $9^\circ 25'$, Show that the KCl crystal has a simple cubic crystal structure.

Q-5 The Bragg angle for (220) reflection from nickel (fcc) is 38.2° , when X-rays of $\lambda = 1.54 \text{ \AA}$ are employed in a diffraction experiment. Determine the lattice parameter of nickel.

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