OMKAR GUJJA.
A71
Assignment - 1

Page No.
Date

Conclus

1) Describe different types of point defects in crystal.

Ans Point defects :- All the atoms in a solid posses vibrational energy and at all temperatures above absolute zero, there will be a finite number of atoms which hold them in their equilibrium position. Once the atoms are free from their lattice sites, they give rise to point defects. Also, due to the presence of impurity prose. impurity atoms - point defect are likely to come in the crystals

Point - Defects.

Non-ionic crystals.

Ionic - crystals.

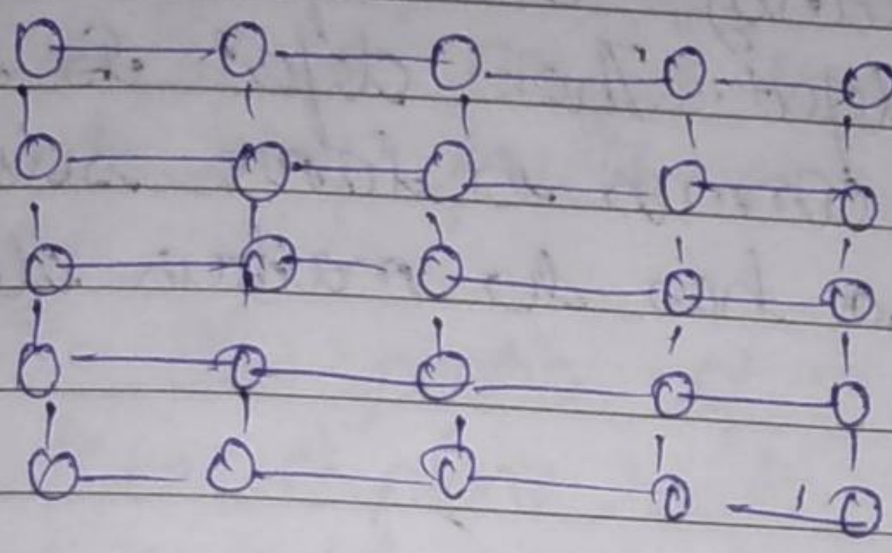
Vacancy Impurity

Other . Schottky Frenkel

Substitutional Interstitial

Vacancies are when an atom is missing from its lattice site in a crystal structure. The atoms surrounding a vacancy experienced a slight displacement

into the empty lattice site and thus, a vacancy is a centre of approximately spherical distortion in the lattice.



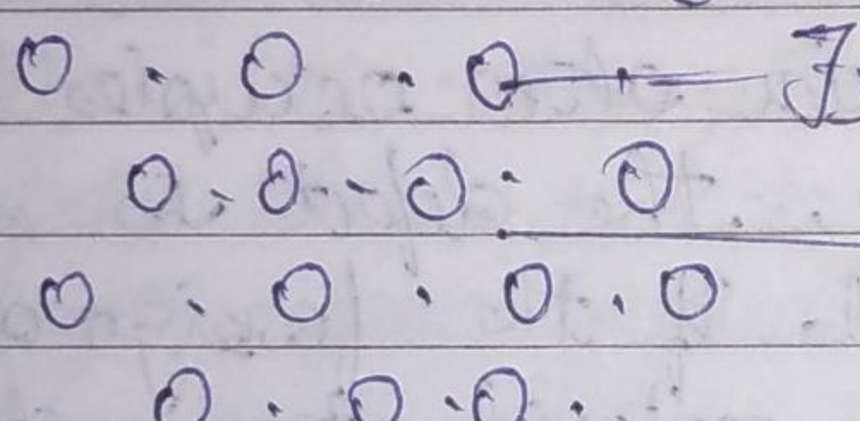
If the matrix atom occupies its own interstial site, the defect is called self-interstitial. If the foreign atom occupies the position of material atom, it is called as substitutional impurity atom. If it occurs occupies an interstitial position of the matrix atom it is called as interstitial impurity atom.

Substitutional impurity atom.

In Self interstial

In Ionic solids, Frenkel and Schottky defects are likely to form. An atom may leave its regular sites and may occupy near by interstitial sits of the matrix giving rise to two defects simultaneously i.e one vacancy and the other self interstial. These two defects together

is called as Frenkel defect. This can occur only for cations because of their small size as compared to the size of anions. When cation vacancy is associated with anion vacancy, the defect is called as shottkey defect. These defect is called as are more common in ionic solids because the lattice as has to maintain electrical neutrality.



The effect of these defects on some of the properties is:-

(1) They increase the hardness and tensile strength due to distortion of the lattice.
They increase the electrical resistivity.
Vacancies increases the kinetics of diffusion ad phase transformation.

Page No.
Date

2) Short note on short stacking faults.

Ans Stacking faults which occurs in FCC metals represent an error in the stacking sequence of close packed planes. At normally, an stacking sequence of ABC ABC ABC is produced in perfect FCC crystal. But due to stacking fault it will be ABC ABAB CBC.

In the portion of the sequence indicated a type. A plane replace within a type C plane would normally be located. This small region, which has a HCP stacking sequence instead of the FCC stacking sequence represents a stacking faults. stacking faults interfere with the slip process.