

Types of Defects in Solid Solids have closely packed constituent particles with the help of a strong force of attraction. Conclusion:– The microscopy technique was used to study defects in solids. Types of point defects:– There are mainly three types of point defects – Stoichiometric defect Non– stoichiometric defect Impurity defect Stoichiometric defect:– This defect is defined as the ratio of cation and anion enduring similarly or we can say that substance stoichiometry is not interrupted and hence called stoichiometry defect. Mainly these defects can be seen in non–ionic solids and metals, crystal density is decreased due to this defect. There are further two types– Anionic vacancy: In this defect, to maintain electrical neutrality, electrons bind to that space where an anion is released. Example– zinc oxide Metal deficiency defect– It happens when in a lattice, cation has less ratio than in anion. In a lattice, atoms can move freely with the help of a facile mechanism due to Schottky's defect. Example– NaCl, KCl Outcomes of Schottky defect:– The density of solid is decreased. For the movement of ions or atoms, this defect provides a facile mechanism. This defect also provides a facile mechanism for the movement of ions and also does not have any impact on density. For the movement of ions and atoms, this defect provides a facile mechanism. Non– stoichiometric defect:– This defect can be happened due to two reasons– In a lattice, substances have a cation whose proportion is more than in an anion. This defect is classified into two main types– Metal excess defect– It happens when in a lattice, cation has more ratio than in anion. Example – NaCl and LiCl Extra cation: In the lattice, extra cation binds to interstitial sites. TABLE OF CONTENT Crystal defect– Types of defects in solids– Line defect– In solids, the crystal arrangement is in a symmetrical pattern and it's called imperfection or defect in solids. Crystal defect can be defined as the withdrawal of complex order and particles' periodic arrangement in the crystal lattice. Cause of crystal defect:– Crystal defect takes place in following factors– Lattice vacancies In a lattice, disturbance of particles. Interstitial defect:– In a lattice, if there is an addition of constituent particles on the interstitial site called interstitial defect. Frenkel defect is defined as the ion release from its regular site and bind on the interstitial site. Example– AgCl and AgBr Outcomes of Frenkel defect:– This defect does not have an impact on density. In a lattice, substances have a cation whose proportion is lesser than in an anion. Impurity defect:– The addition of ions with different oxidation states is carried out by chemical impurities called impurity defects. Types of defects in solids:– Mainly classified into two types– Point defect. Line defect:– In line defect, solid expands above the microscopic region in a row of the crystal lattice. Point defect:– In lattice, disturbance of particles, as they move from one place to another cause the imperfection or defect in the crystal lattice. Vacancy defect :– When there is the absence of particles in some place in a lattice and create a vacancy called vacancy defect. But instead of decreasing the vacancy defect, this defect increased the crystal density. Frenkel defect:– This defect can also be known as dislocation defect and was observed by scientists in the year 1926. an n–type semiconductor is formed when doping is with impurities of electrons. A p–type semiconductor is formed when doping with a defective electron. In some defects the density of solid increases, in some density is decreased and in some solid, it doesn't affect. Some defects help to maintain the charge of electrons and some variation in cations and anions. Defects happen in a very fast way because particles are closely packed in a solid they do not rearrange themselves. These defects can be detected in non–ionic and ionic solids both. This defect can be seen in non–ionic solids and metals. In this defect, cations and anions are missing from a

lattice, in an equal amount. This defect brings down the density of particles but does not affect the crystal stoichiometry. Mostly occupied on that crystal in whose cation and anion are irregular in size. An anion trapped electron to catch them is referred to as f- centre. Different oxidation states are varied by compound cations. This defect can make a vacancy of captions in a lattice. Mainly defects of solid are of two types – line and point defect and then point defect is further classified in three different types. Types of defects in solid explain various features of defects and reason behind imperfection of solid. For the formation of crystal processes, defects take place. Crystal defect:– Absolute crystals are formed only at 0K temperature, and other crystals are not absolute. These defects are also known as intrinsic or thermodynamic defects. Schottky defect:– This kind of point defect was developed by German scientist Schottky in the year 1930. And hence known as a metal excess defect. And hence called a metal deficiency defect. The cavities present are coloured centres. And hence extra positive charge is created which is further maintained by electron numbers. Impurities that can be added to crystals are called doping. Impurities are added in ions or the presence of an ionic solid. Small crystals arranged together closely make a solid. A non-stoichiometric amount of ions. Lattice impurities. There are two types of stoichiometry defects. Stoichiometry of this defect is not affected. In the above article, we learned about many defects that happen in solids. In this article, we study the defects in solid. Line defect. There are three types of point defects. Example– iron compound crystal and copper compound crystal.