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**TYPES OF SOLIDS AND
DEFECTS**

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TYPES OF SOLIDS

1. Crystalline solids or true solids
2. Amorphous solids

Crystalline or true solids

These solids exist as small crystals, each crystal having a characteristic geometrical shape. In a crystal atoms, ions or molecules are arranged in a regular repeating three-dimensional pattern called **crystal lattice**. These solids are Anisotropic in nature.

EXAMPLE : Sugar and Salt

Amorphous Solids

Amorphous means no form in German language. In these solids atoms, ions or molecules arranged in random manner and lacks the ordered crystal Lattice. These solids are Isotropic in nature

EXAMPLE : Rubber, Plastic and Glass.

CRYSTAL DEFECTS

The real crystal that we find in nature or laboratory always contain imperfections in the formation of crystal lattice. These defects can affect the physical and chemical properties of of a solid. Some of the common defects are:

- ❖ Vacancy defect
- ❖ Interstitial defect
- ❖ Impurity defect

VACANCY DEFECT

When a crystal site is rendered vacant by removal of a structural unit in the lattice , the defect is referred to as the Vacancy defect, In an ionic crystal , a cation and an anion may leave the lattice to cause two vacancies. Such a defect which involves a cation and an anion vacancy in the crystal lattice is called a Schottky defect.

This defect is found in Sodium Chloride and Cesium Chloride

INTERSTITIAL DEFECT

In these defect a ion leaves its regular site to occupy a position in the space between the lattice sites (interstitial position). This cause a defect aknown as Interstitial defect or Frenkel defect. Ordinarily the cation moves as it is smaller than the anion and can easily fit into the vacant space in the lattice.

Thus in AgCl crystal , Ag⁺ion occupies inerstitial position.

IMPURITY DEFECT

The impurity defect found in stainless steel is interstitial impurity defect. In interstitial impurity defect, the impurity of cation is present in the interstitial position and make crystal defected. Stainless steel is an alloy of Iron and 4% Chromium mixed with it. Stainless steel typically contains about 1% Carbon, 1–5% Manganese, 0.05% Phosphorous, 1–3% Silicon, 5%–10% Nickel and 15%–20% Chromium. Carbon is a second-period element that is non-metallic and much smaller than iron. Carbon will therefore tend to occupy interstitial sites in the iron lattice.

THANK YOU

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