

Physics Notes Class 12 Chapter 14

Semiconductor Electronics, Materials, Devices and Sample Circuits

It is the branch of science which deals with the electron flow through a vacuum, gas or semiconductor.

Classification of substances on the basis of conduction of electricity.

Solid

We know that, each substance is composed of atoms. Substances are mainly classified into three categories namely solids, liquids and gases.

In each solid atoms are at a definite positions and the average distance between them is constant.

Depending upon the internal arrangement of atoms, solids are further divided into two groups.

1. Crystalline Solids

The solid in which the atoms are arranged in a regular order are called the crystalline solids. In other words, we can say that in a crystalline solid, there is periodicity and regularity of its component atoms in all the directions. For example sodium chloride (common salt), diamond, Sugar, silver etc are the crystalline solids.

Their atoms are arranged in a definite geometrical shape.

They have a definite melting point.

They are anisotropic, i.e., their physical properties such as thermal Conductivity refractive index etc, are different in different directions.

They are the real solids.

2. Amorphous Solids

The Solids in which the atoms do not have a definite arrangement are called the amorphous solids. They are also called the glassy solids. For example glass, rubber, plastic, power, etc are the amorphous solids.

They do not have a definite arrangement of its atoms, i.e., they do not have a characteristic geometrical shape.

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SJ Ball



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The Physics of Semiconductors Kevin F. Brennan,1999-02-13 Modern fabrication techniques have made it possible to
produce semiconductor devices whose dimensions are so small that quantum mechanical effects dominate their behavior This
book describes the key elements of quantum mechanics statistical mechanics and solid state physics that are necessary in
understanding these modern semiconductor devices The author begins with a review of elementary quantum mechanics and
then describes more advanced topics such as multiple quantum wells He then disusses equilibrium and nonequilibrium
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motion in periodic potentials electron phonon interaction and recombination processes The final four chapters deal
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Peter Van Zant, 2013-10-22 The most complete current guide to semiconductor processing Fully revised to cover the latest advances in the field Microchip Fabrication Sixth Edition explains every stage of semiconductor processing from raw material preparation to testing to packaging and shipping the finished device This practical resource provides easy to understand information on the physics chemistry and electronic fundamentals underlying the sophisticated manufacturing materials and processes of modern semiconductors State of the art processes and cutting edge technologies used in the patterning doping and layering steps are discussed in this new edition Filled with detailed illustrations and real world examples this is a comprehensive up to date introduction to the technological backbone of the high tech industry

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