SEMICONDUCTOR PHYSIC

Metals are classified in to three types based on number of electronics in outer most orbit.

1.conductors

2.semicondctors

3.insulators

Conductors whose outermost orbits has greater than four valance electrons or conduction band and valance bands are overlapped is conductors. Insulators whose outermost orbits has lesse than four valance electrons or gap between conduction band and valance bands is very large. Semiconductors are of two types pure silicon crystal or germanium crystal is known as an intrinsic semiconductor. There are not enough free electrons and holes in an intrinsic semi-conductor to produce a usable current. The electrical action of these can be modified by doping means adding impurity atoms to a crystal to increase either the number of free holes or no of free electrons.

When a crystal has been doped, it is called a extrinsic semi-conductor. They are of two types

- n-type semiconductor having free electrons as majority carriers
- p-type semiconductor having free holes as majority carriers

By themselves, these doped materials are of little use. However, if a junction is made by joining p-type semiconductor to n-type semiconductor a useful device is produced known as diode. It will allow current to flow through it only in one direction. The unidirectional properties of a diode allow current flow when forward biased and disallow current flow when reversed biased. This is called rectification process and therefore it is also called rectifier.