

Lecture 1: Band Theory, Potential Barrier

▼ Class	Applied Physics
▼ Type	Lecture
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Marks Format

Lecture Notes

Conductivity and Electrical Conductivity

Band Theory

Potential Barrier

Conduction

Marks Format

Sessional 30%:

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Lecture Notes

▼ **Conductivity and Electrical Conductivity**

When analyzing basic materials in terms of energy transmission, there are three types of materials in physics given below.

1. Conductors
2. Semi-Conductors
3. Insulators

▼ **Band Theory**

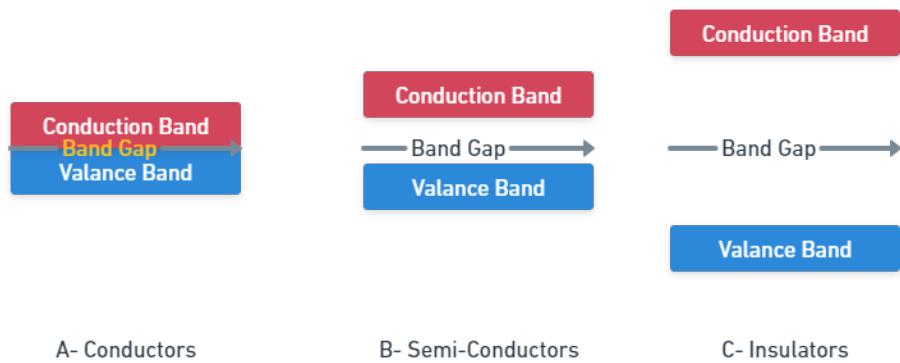
This is the theory which is applied to categorize all materials into three of above types. It states that “There are two bands in any materials”.

These two bands are:

1. Valence Band (V.B)
2. Conduction Band (C.B)

▼ **Band Gap**

There is a gap between “Valence Band” and “Conduction Band” known as “Band Gap”. The less “Band Gap” a material has, better will be it’s conductivity.

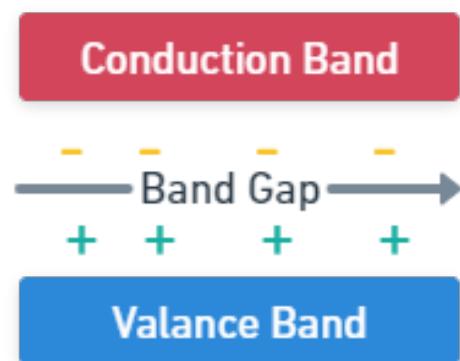


▼ Potential Barrier

There is energy present in the “Band Gap” that works as a barrier for valence electrons to go to conduction band to perform conduction. The potential barrier is generally represented in electron volt (ev).

▼ Conduction

When the energy is provided to the valence band electrons, they pass through the potential Barrier and shift to the conduction band. Due to this shifting of electrons there is a negative charge on the conduction band and positive charge on the valence band as shown in figure below.



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