

INTRINSIC & EXTRINSIC SEMICONDUCTOR

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INTRINSIC SEMICONDUCTOR

- ❑ A semiconductor in an extremely pure form is known as an intrinsic semiconductor.
- ❑ In an intrinsic semiconductor, even at room temperature, hole electron pairs are created.
- ❑ When electric field is applied across an intrinsic semiconductor, the current conduction takes place by two process, namely by free electrons and holes.
- ❑ The total current inside the semiconductor is the sum of currents due to free electrons holes.

FIGURE 1a & 1b

Figure 1a

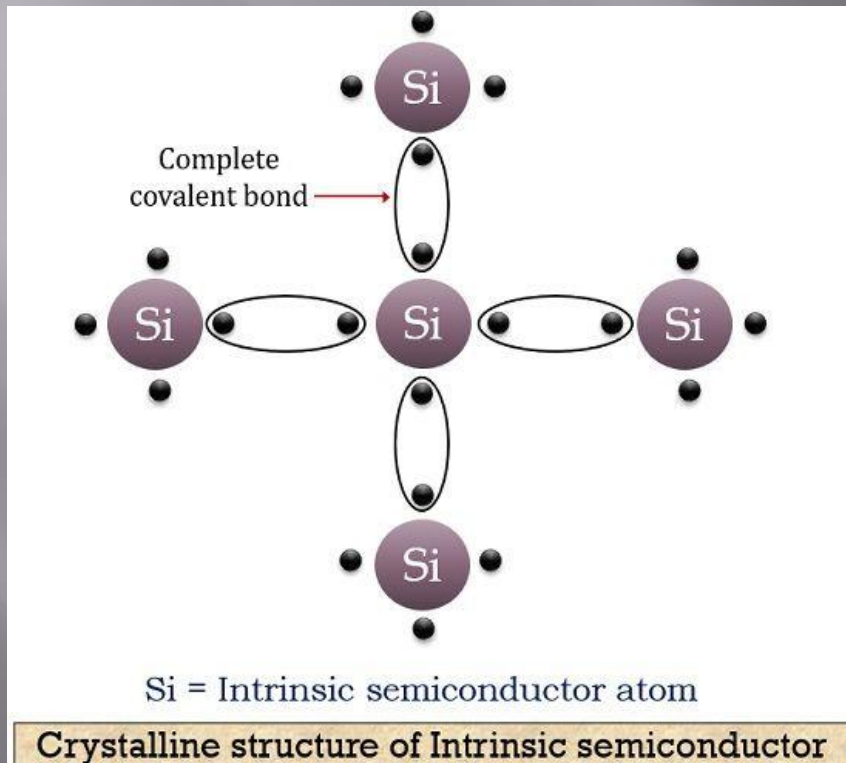
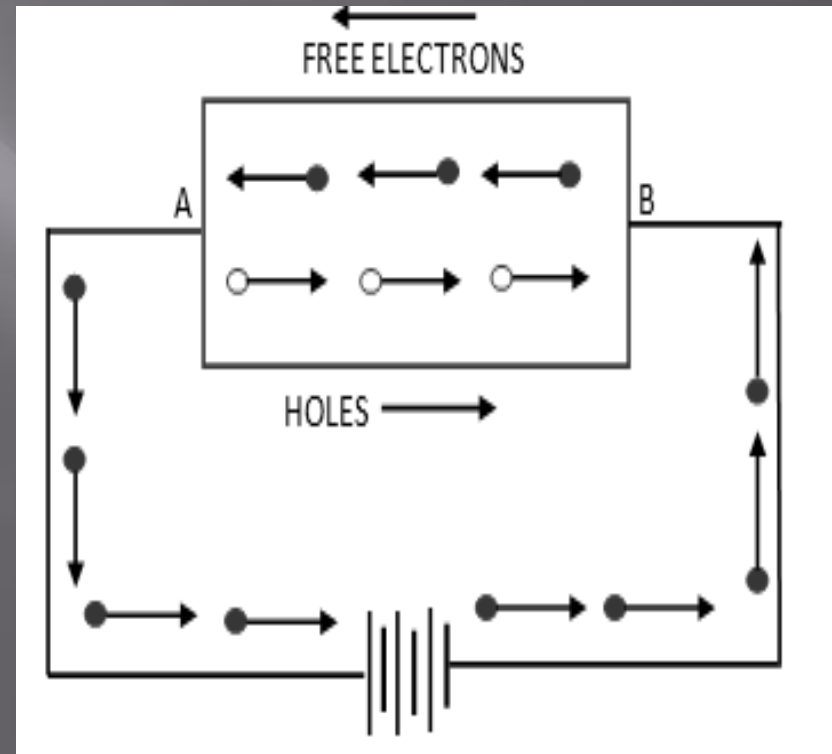


Figure 1b

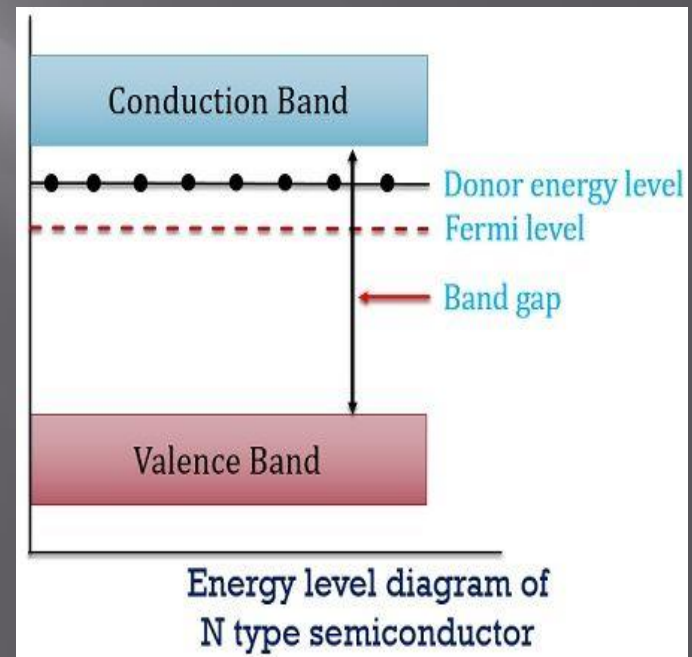
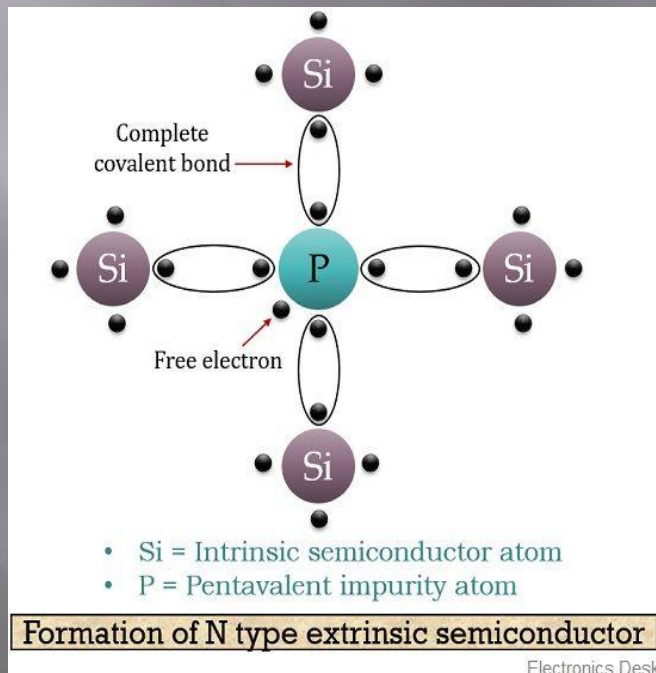


EXTRINSIC SEMICONDUCTOR

- ▣ Semiconductor achieved by adding a small amount of suitable impurity. It is then called impurity or extrinsic semiconductor.
- ▣ Depending upon the type of impurity added, extrinsic semiconductor are classified into
 - i. n-type semiconductor
 - ii. p- type semiconductor

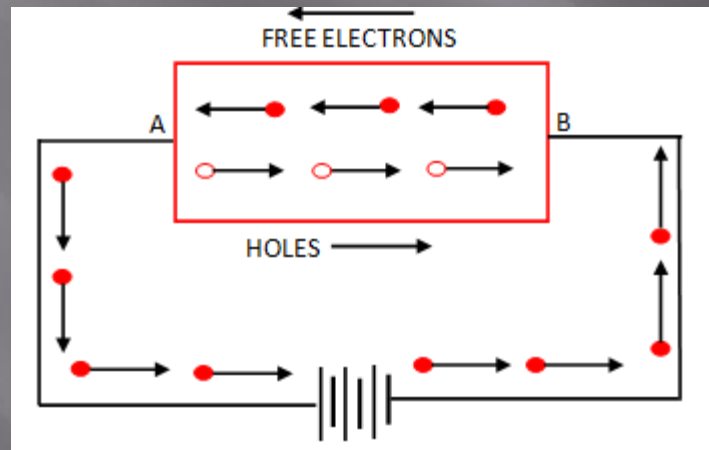
N type semiconductor

- When a small amount of pentavalent impurity is added to a pure semiconductor, it is known as n-type semiconductor



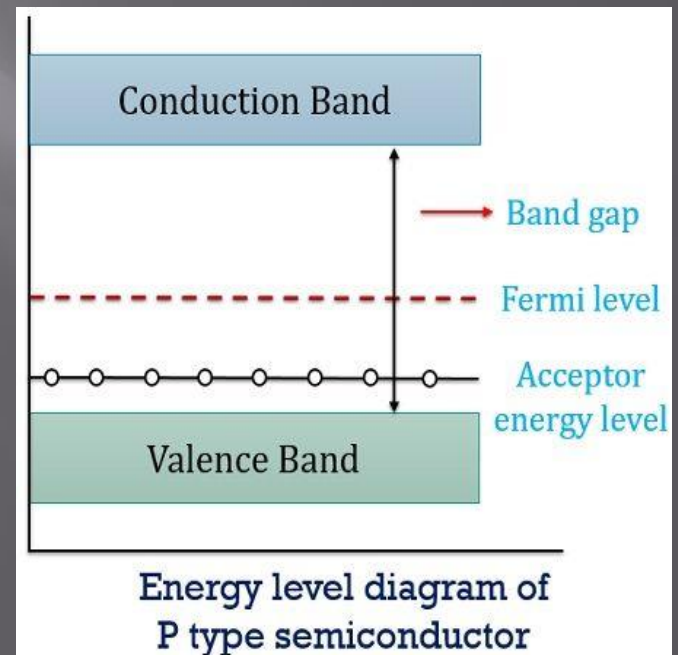
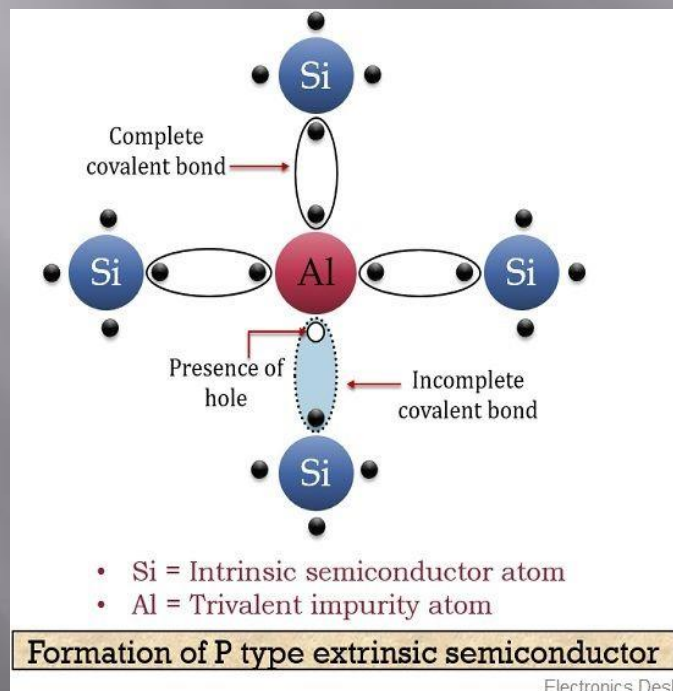
N type conductivity

- ▣ The current conduction in an n type semiconductor is predominantly by free electrons i.e., negative charges & is called n-type or electron type conductivity.



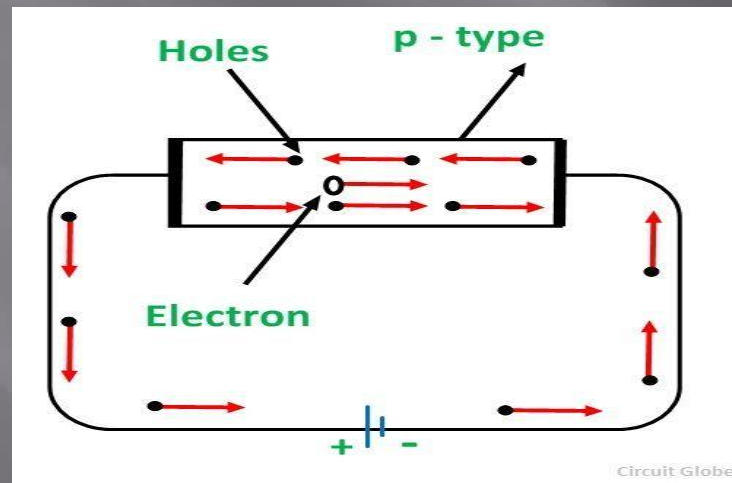
P type semiconductor

- When a small amount of trivalent impurity is added to a pure semiconductor it is called p type semiconductor



P type conductivity

- ▣ The current conduction in p type semiconductor is predominantly by holes i.e., positive charges and is called p type or hole type conductivity.



THANK YOU