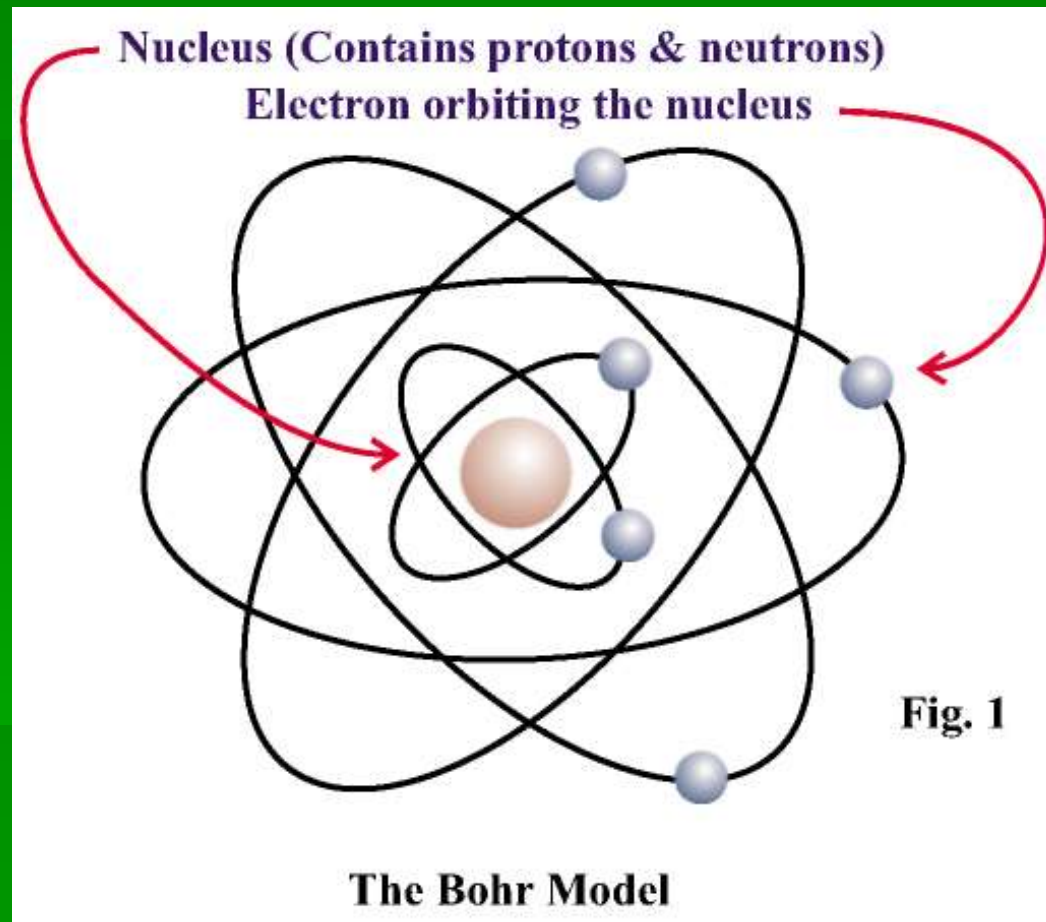
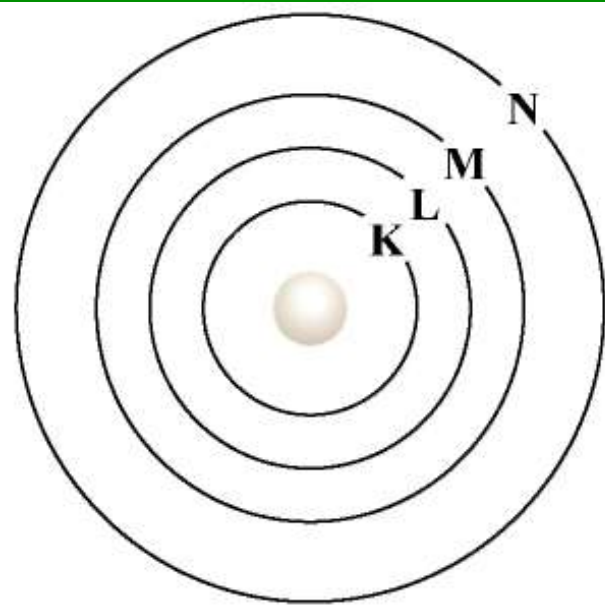






Shells or Energy Levels

Figure 2

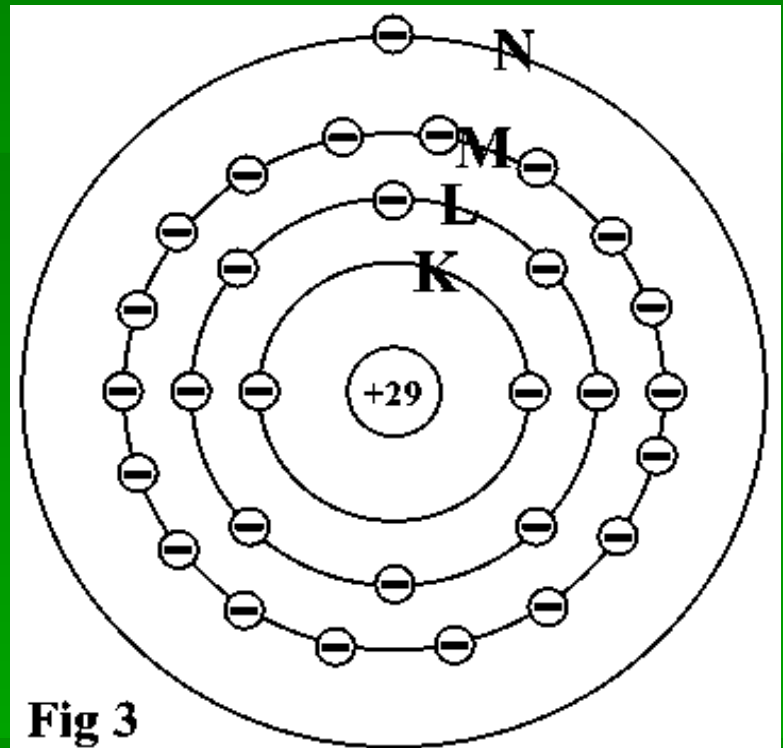


Fig 3

Copper Atom

29 protons

29 electrons

35 neutrons

Piece of Copper Wire

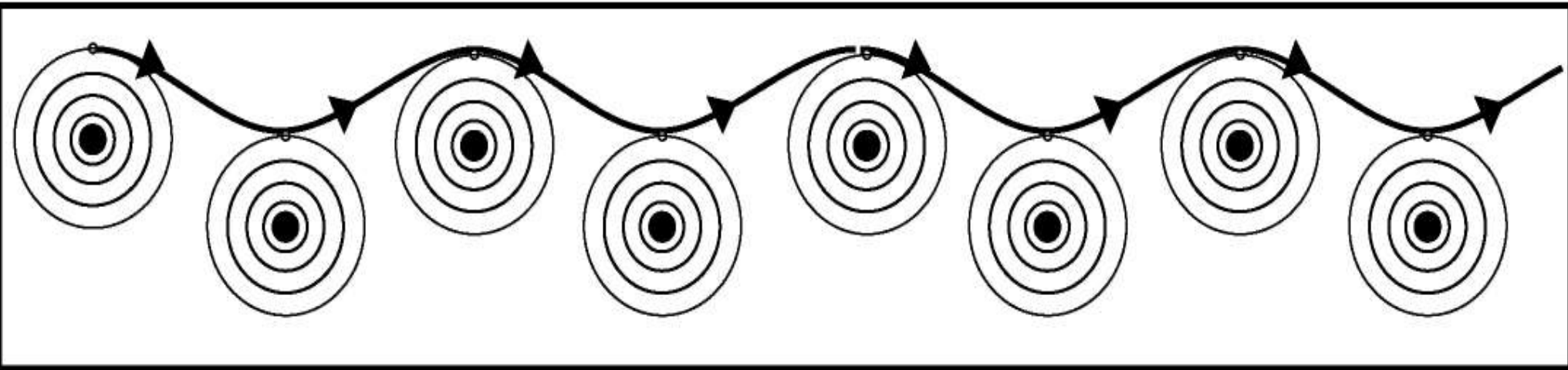
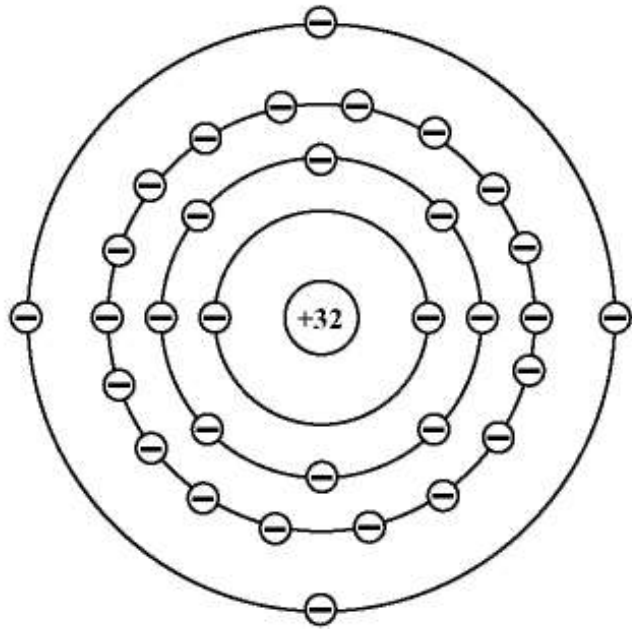


Fig 4

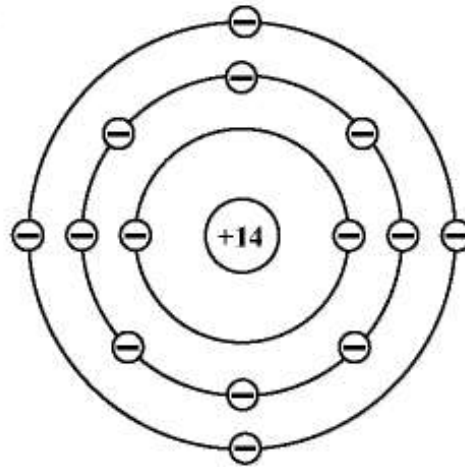
Electrical force



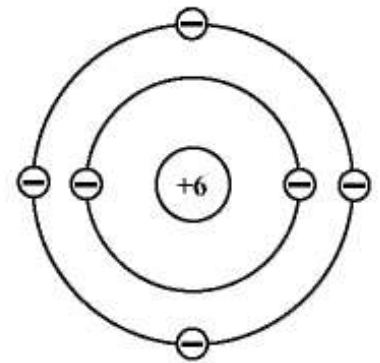
Fig. 5



Germanium Atom



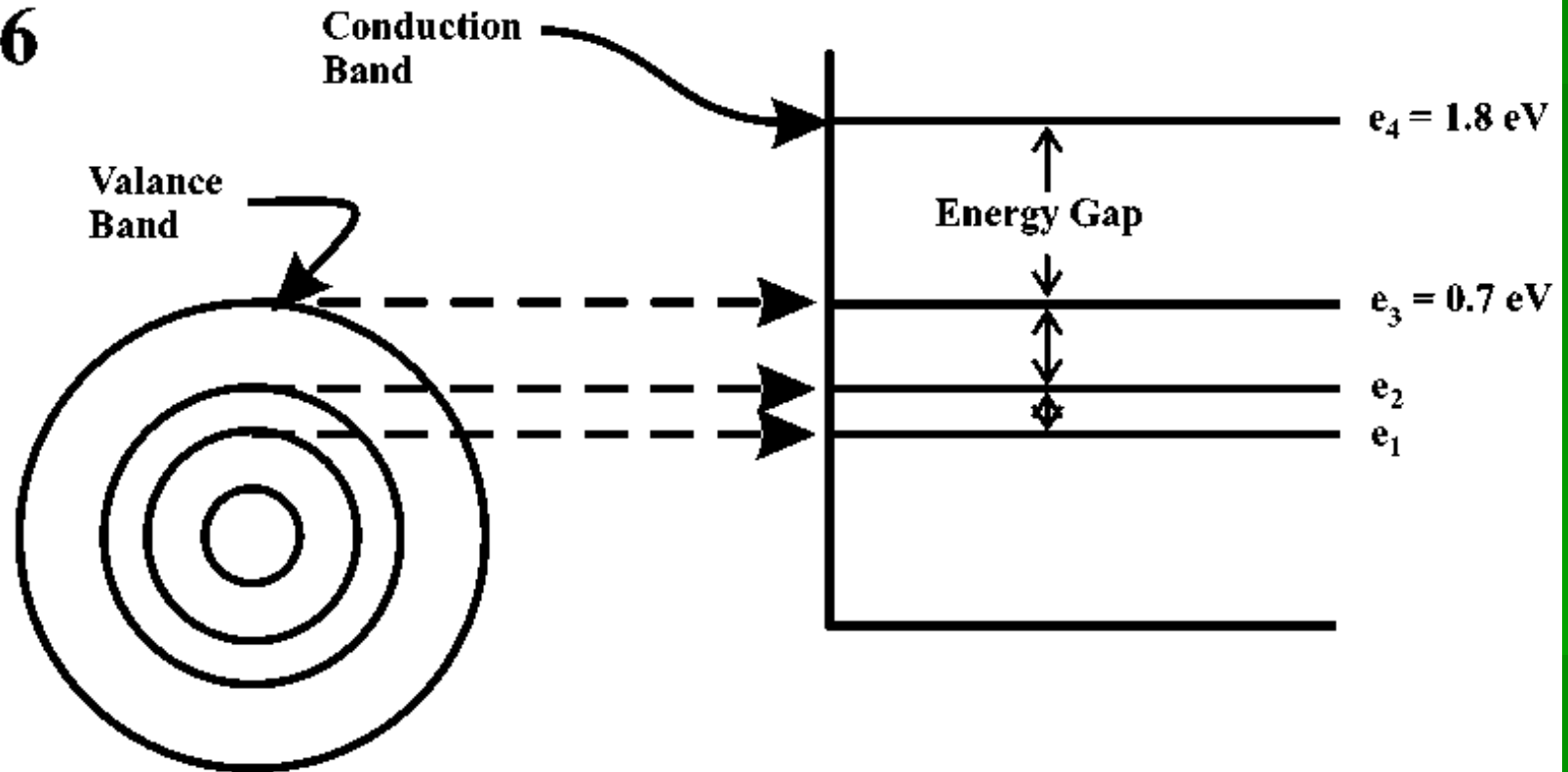
Silicon Atom

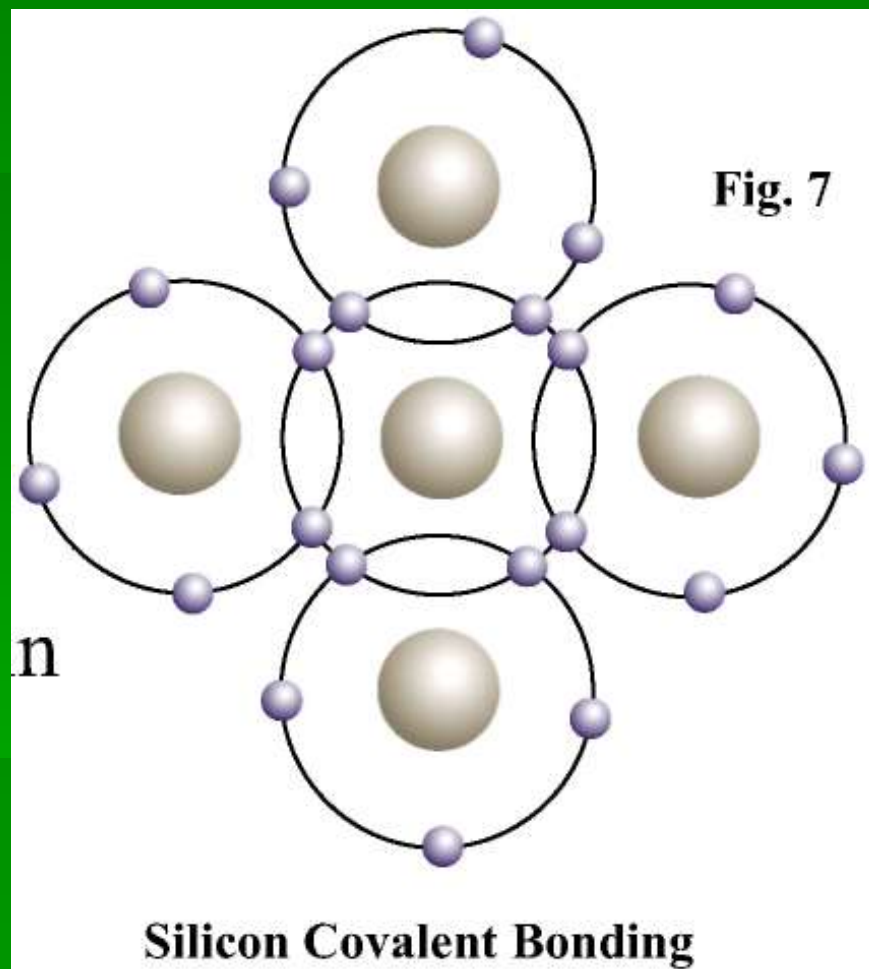


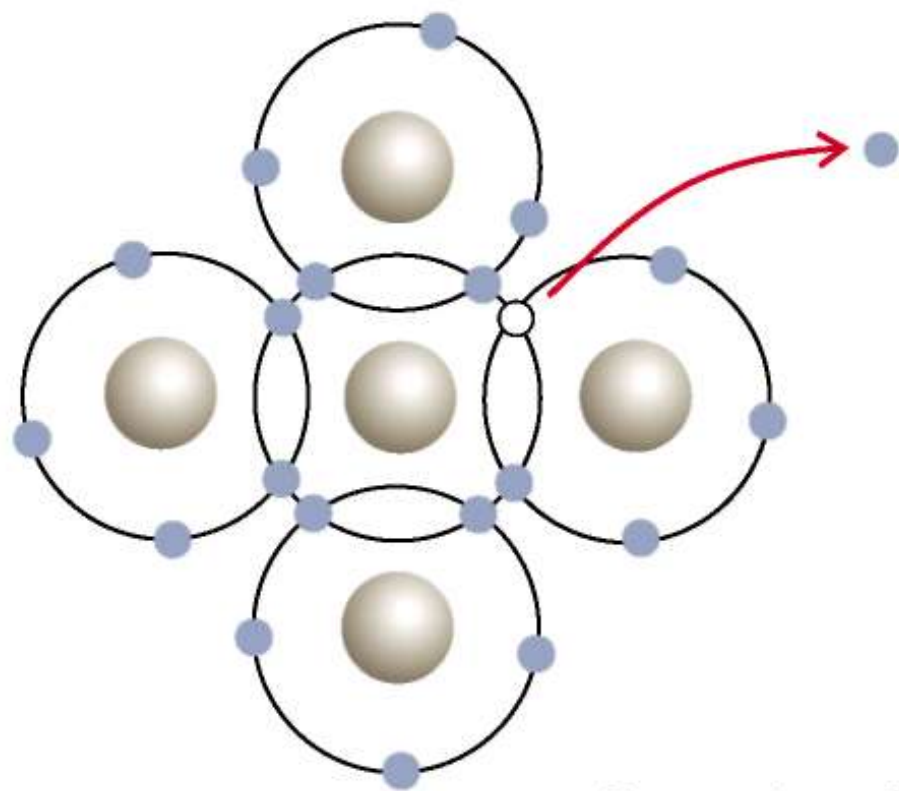
Carbon Atom

Silicon Energy Gaps and Levels

Fig. 6







Conduction
Band

Valance
Band

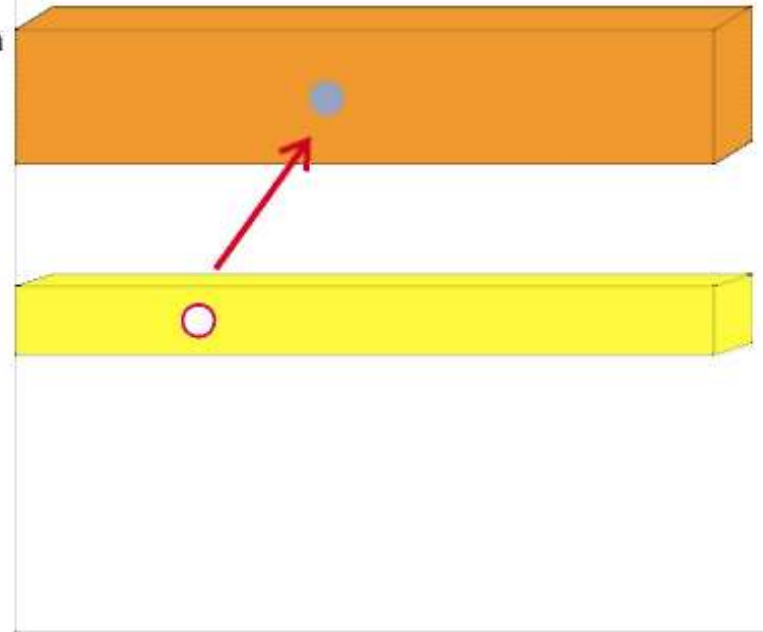


Fig. 8

Generation of an electron-hole pair

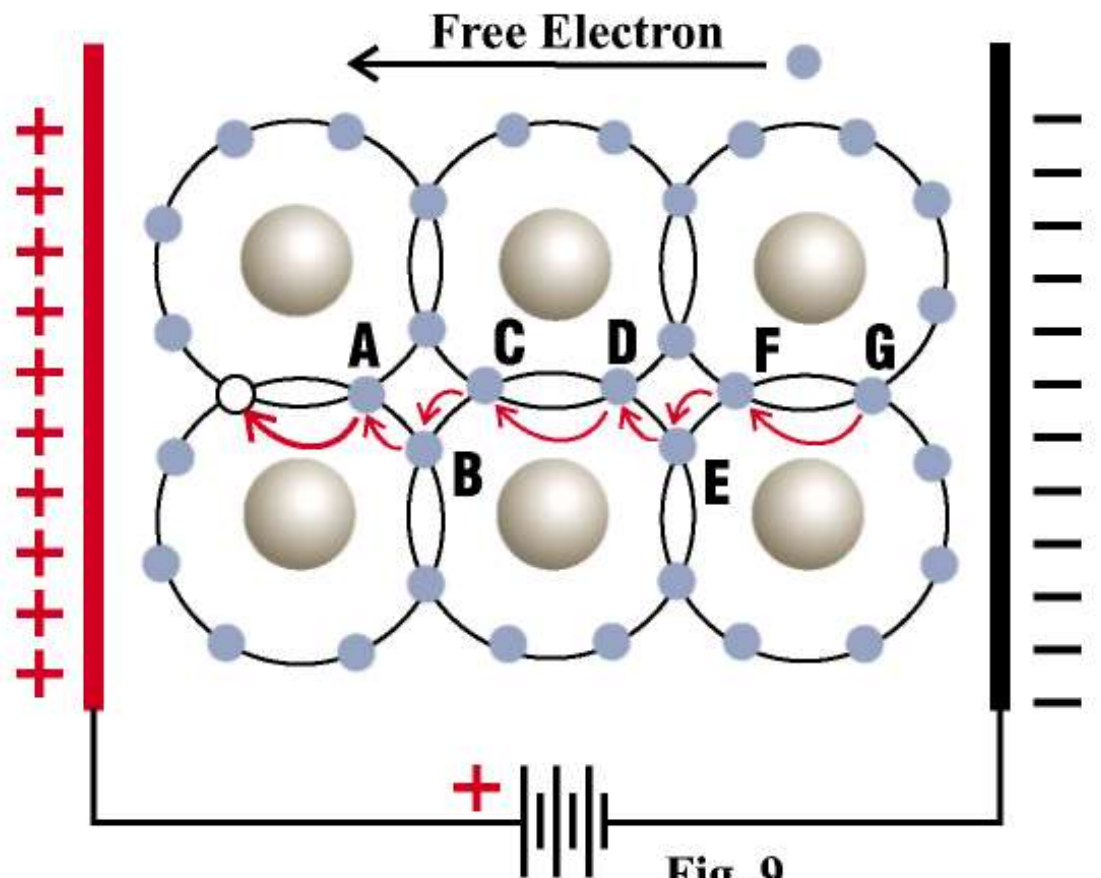
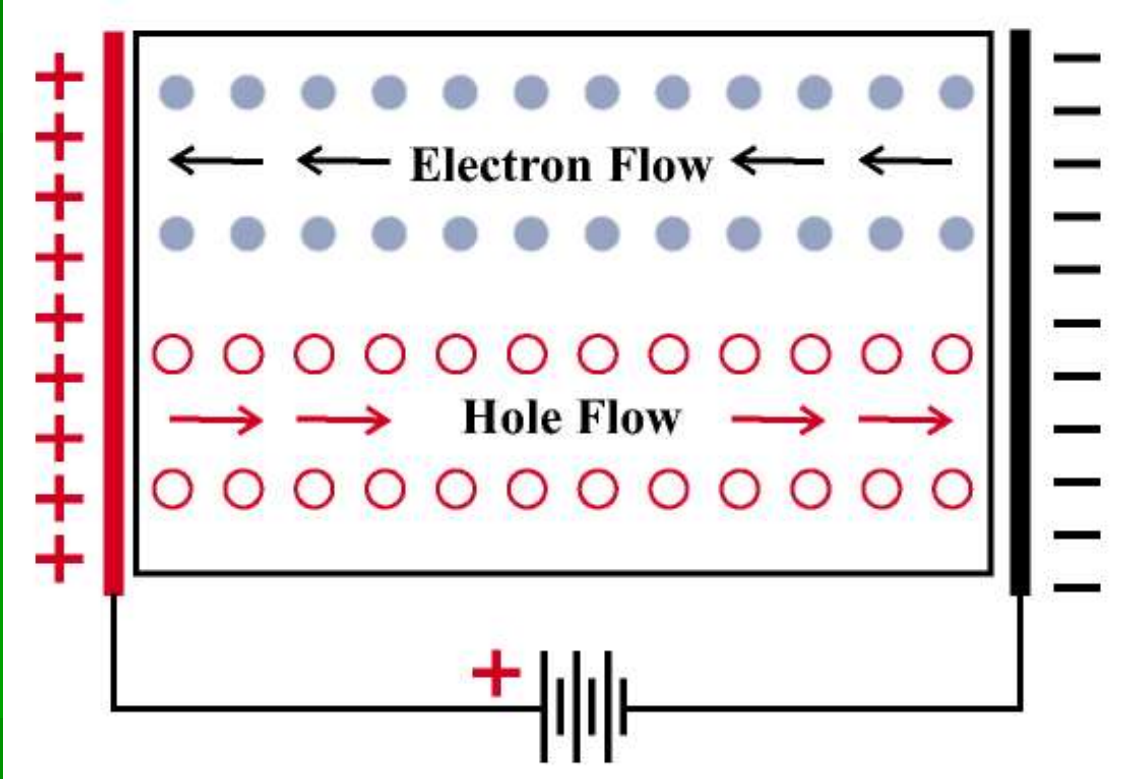
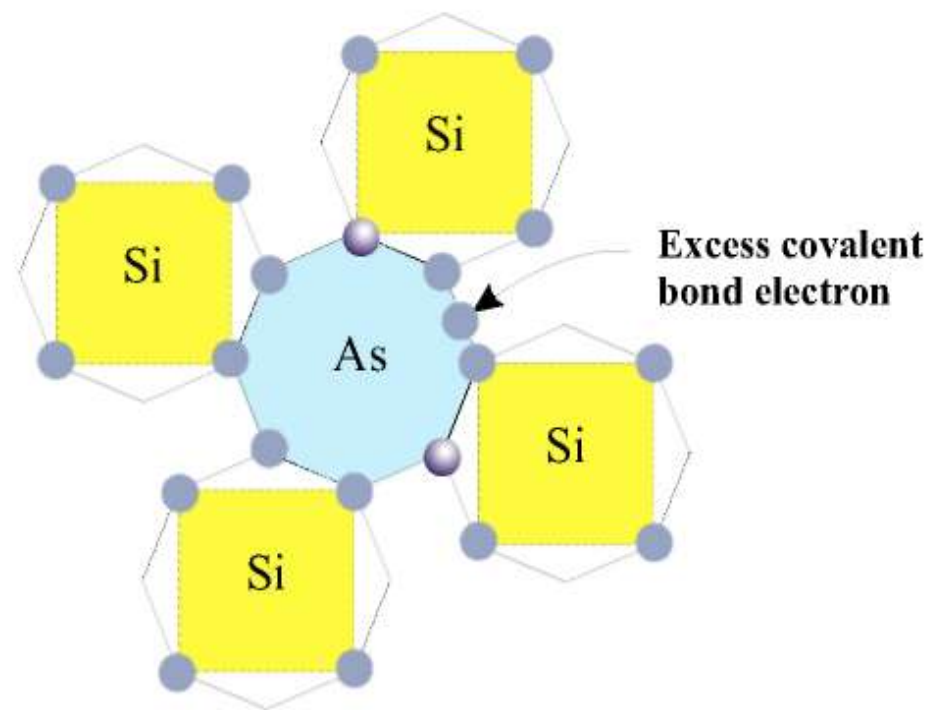


Fig. 9

Current Flow in an Intrinsic Crystal
The Flow of Holes





**Conduction
Band**

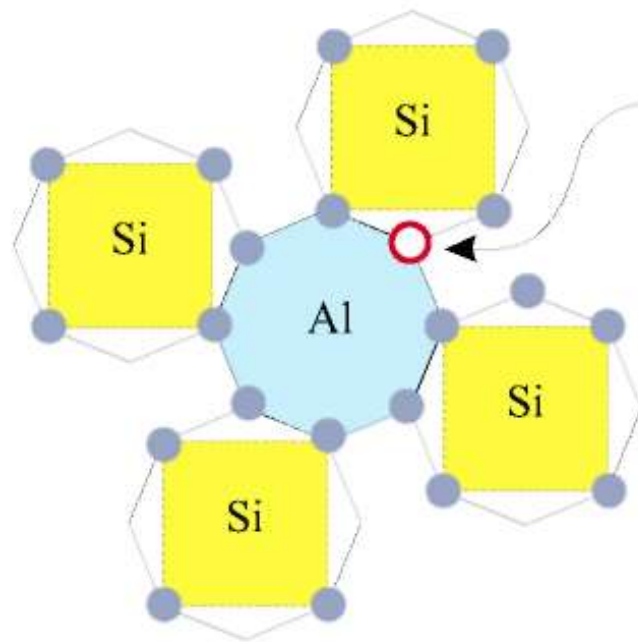


Electrons (Majority Carriers)

**Valance
Band**

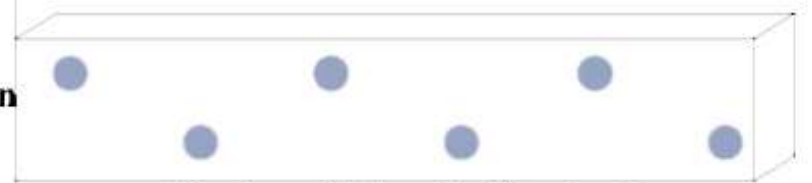


Holes (Minority Carriers)



Hole in the
covalent bond

Conduction
Band

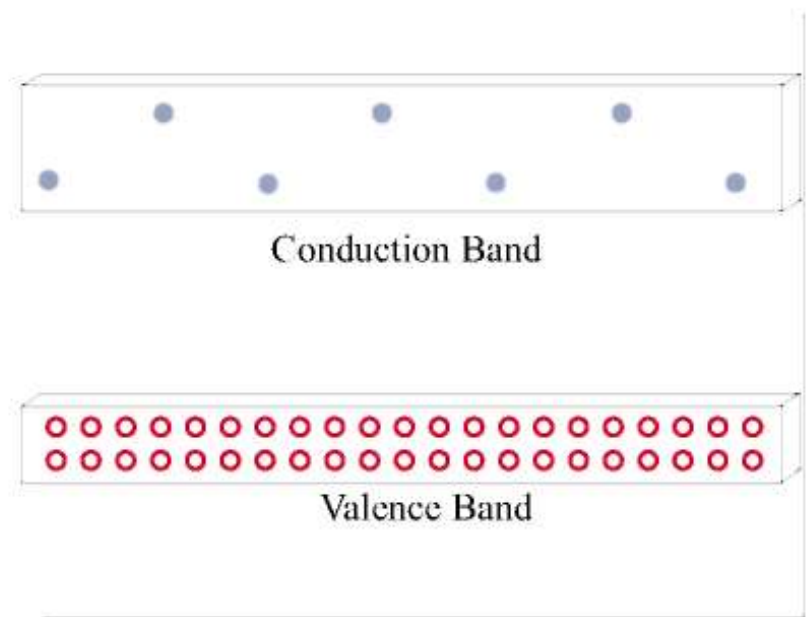
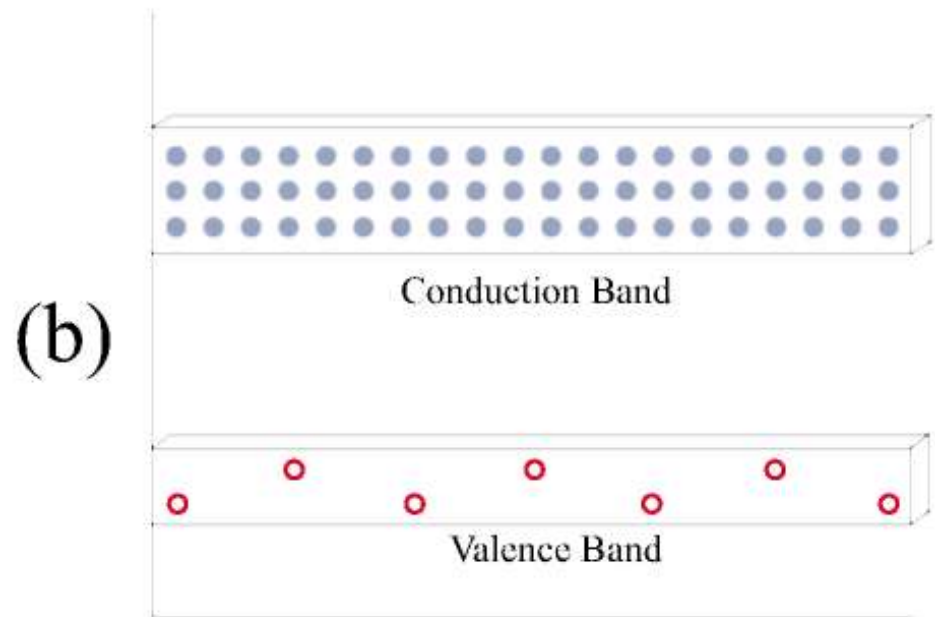
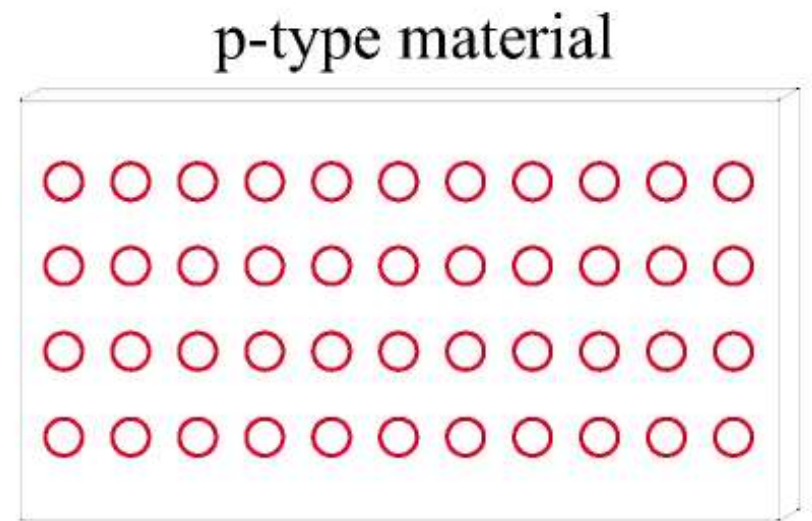
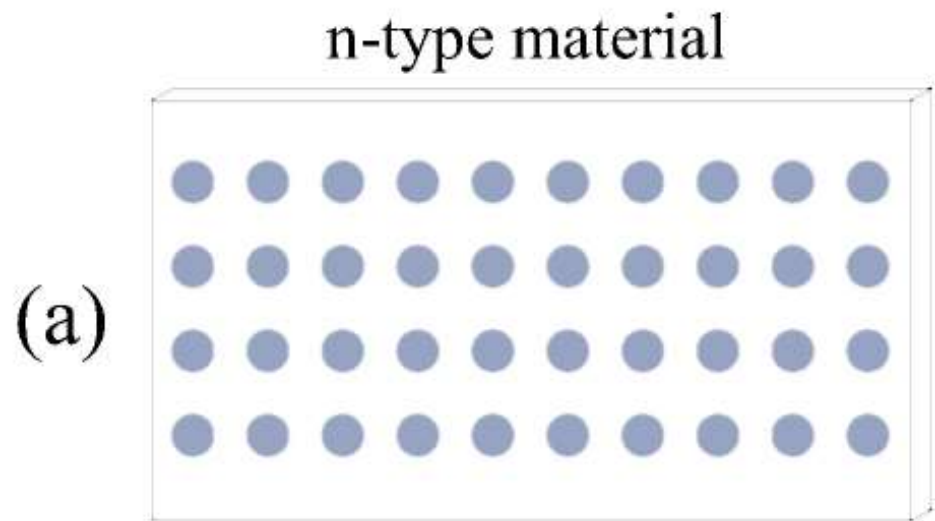


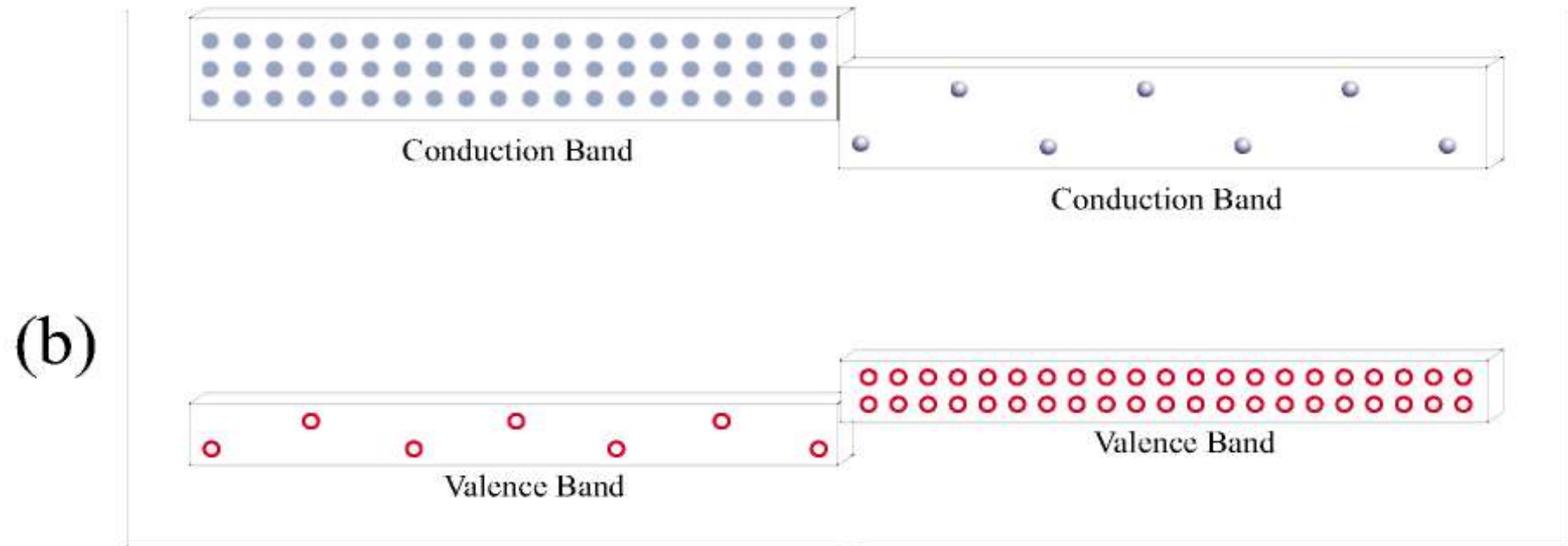
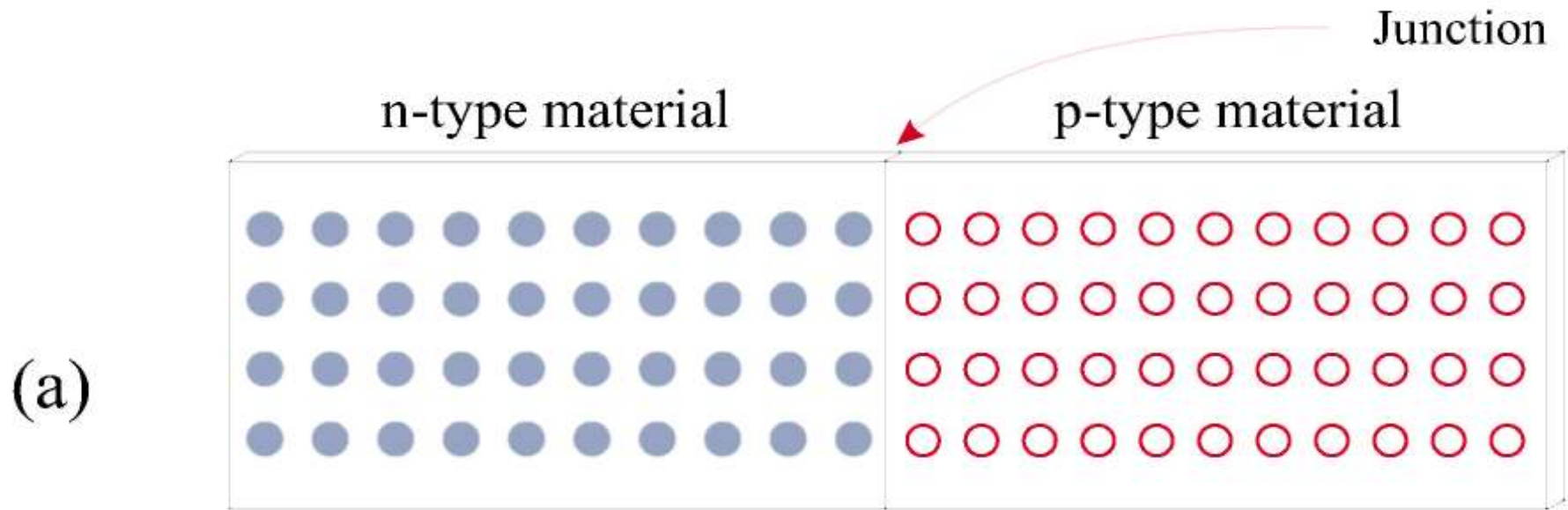
Electrons (Minority Carriers)

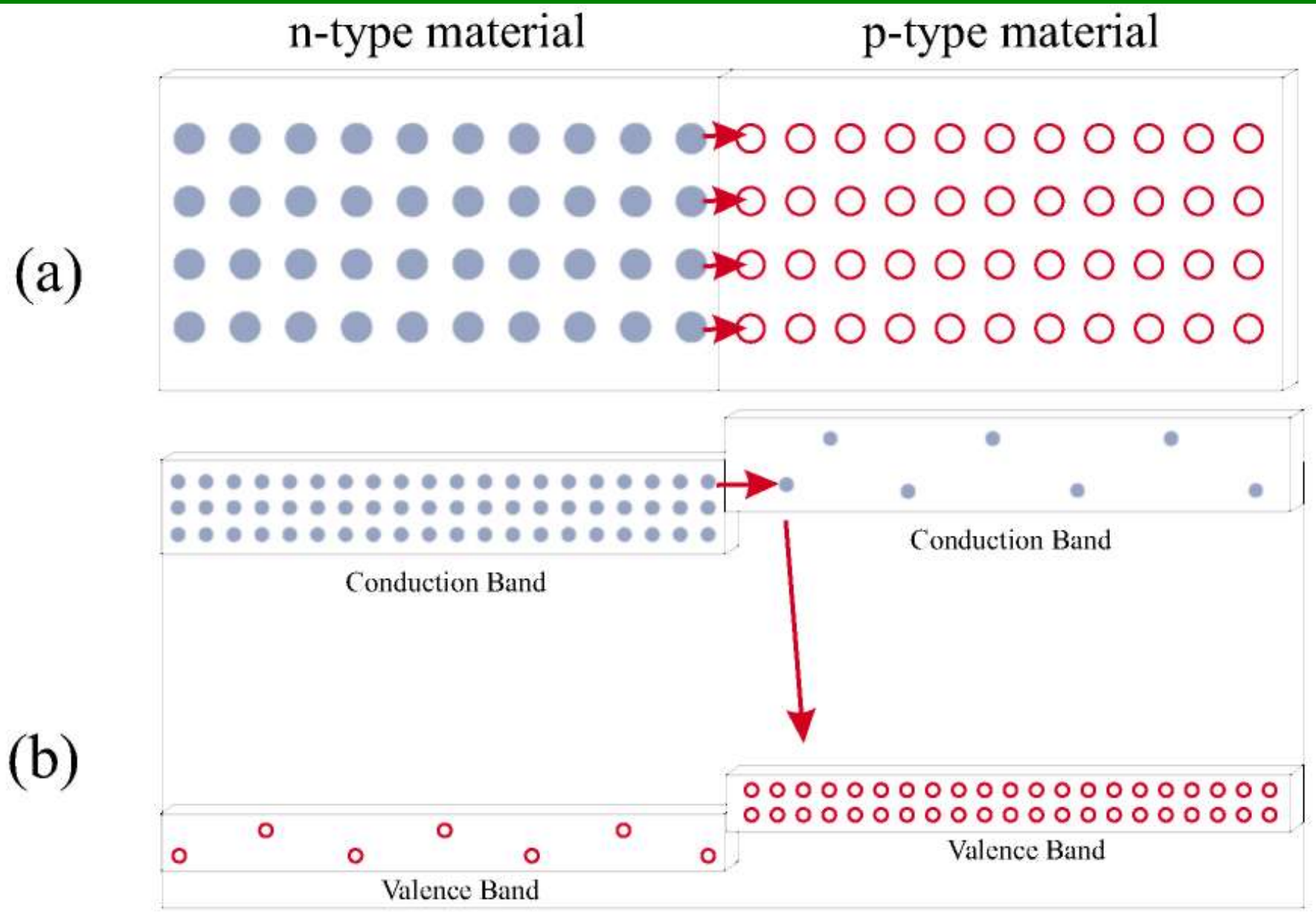
Valance
Band

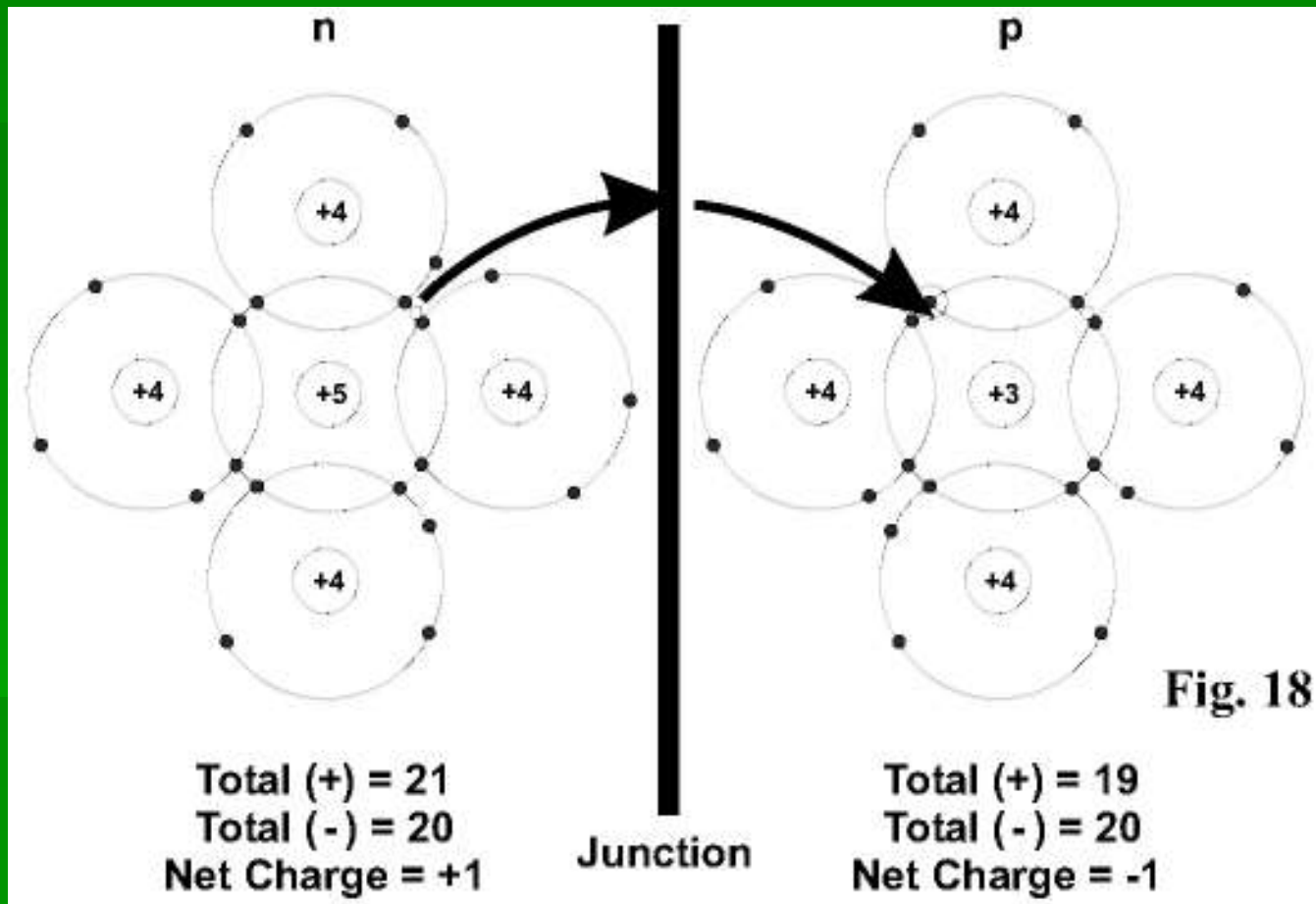


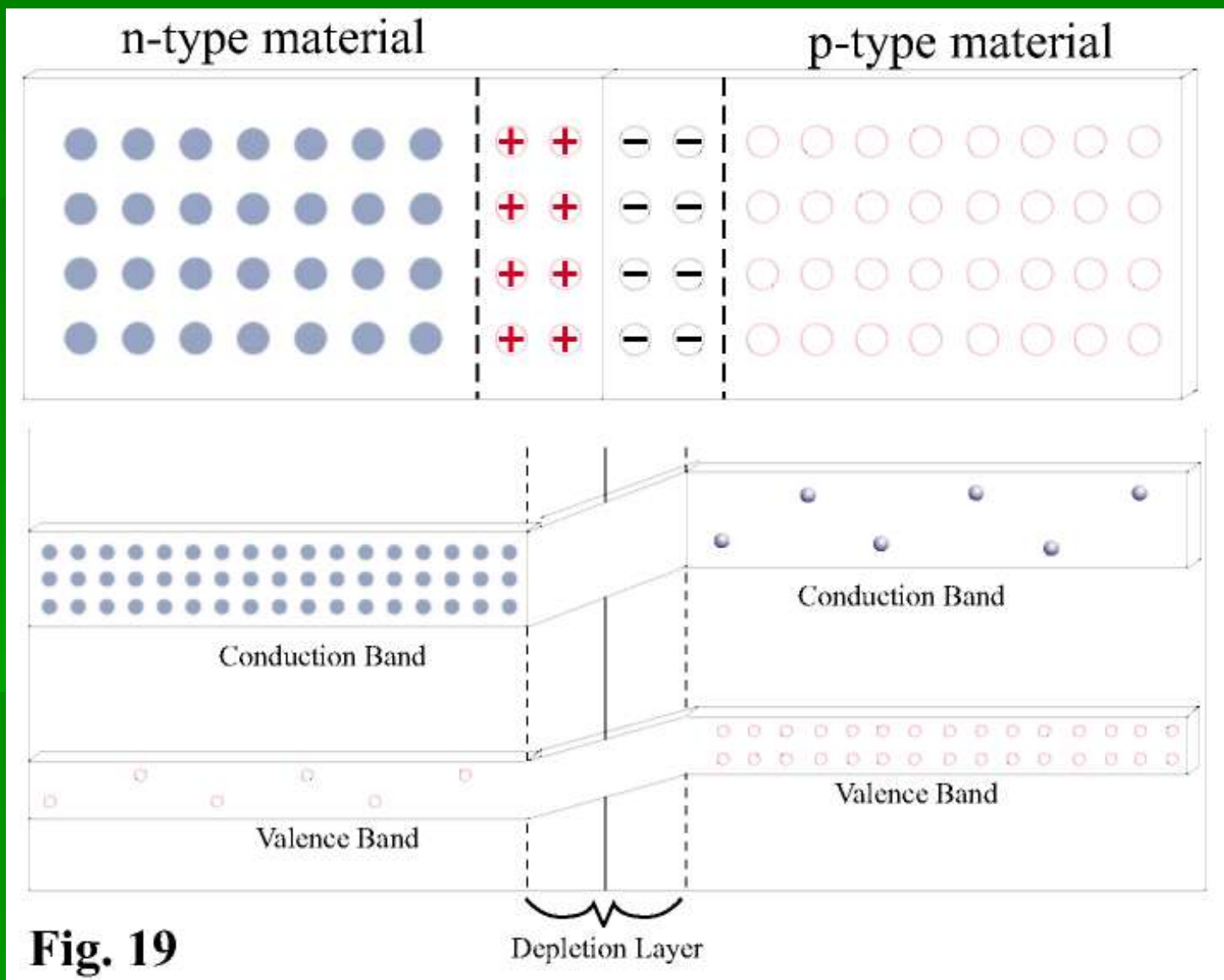
Holes (Majority Carriers)

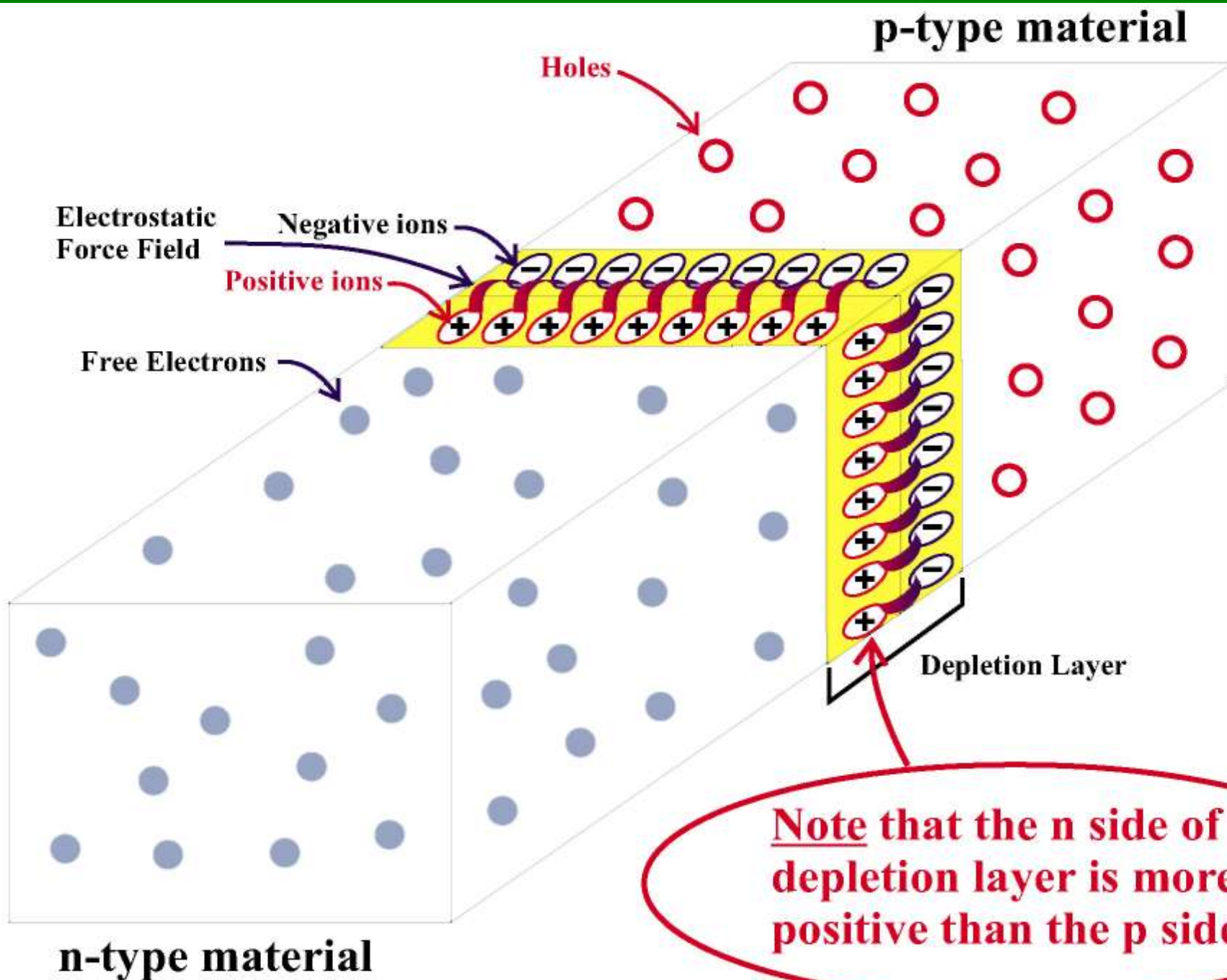


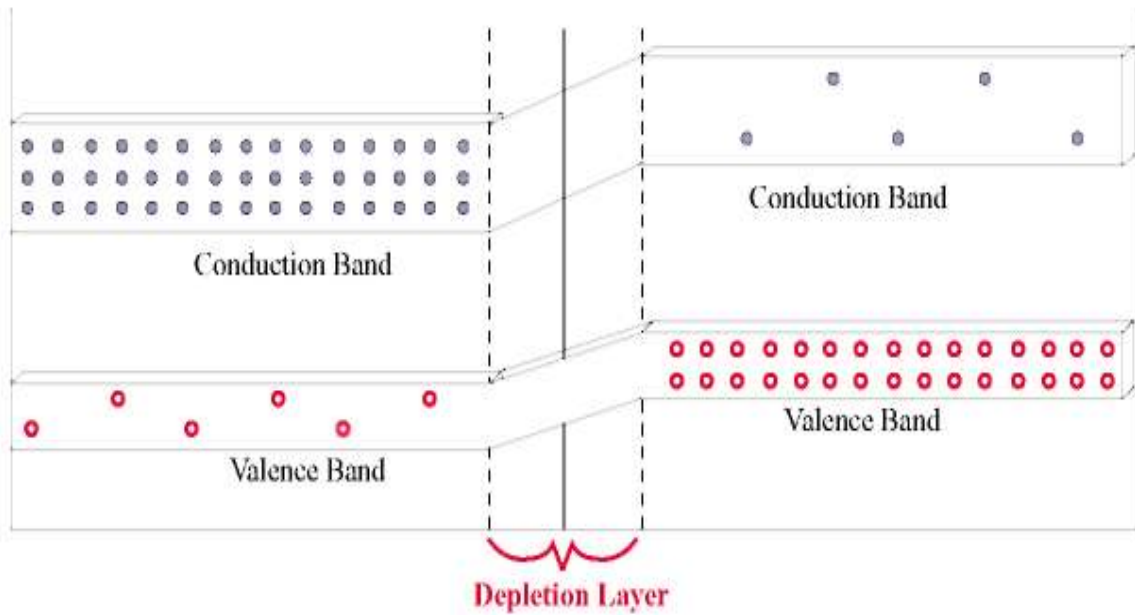
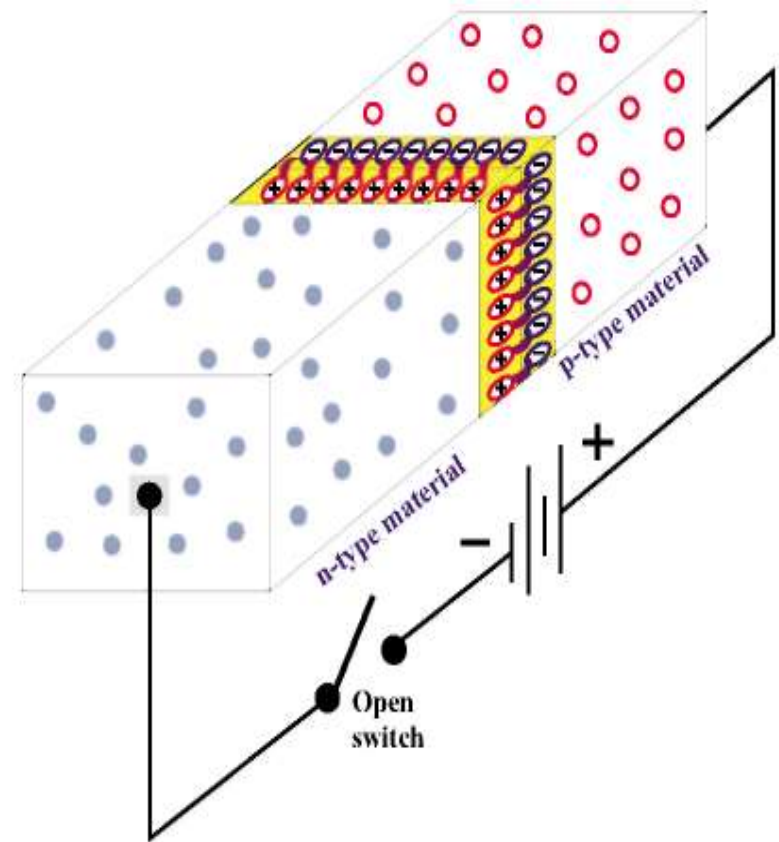


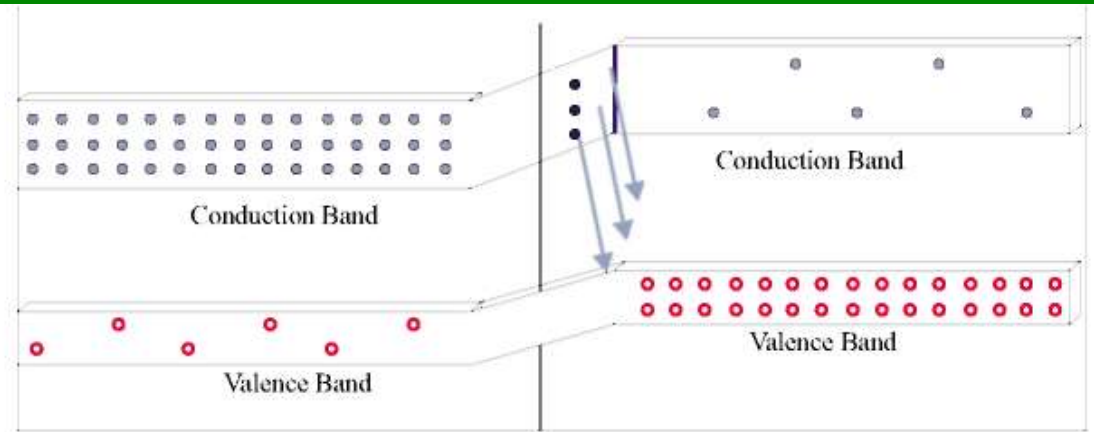
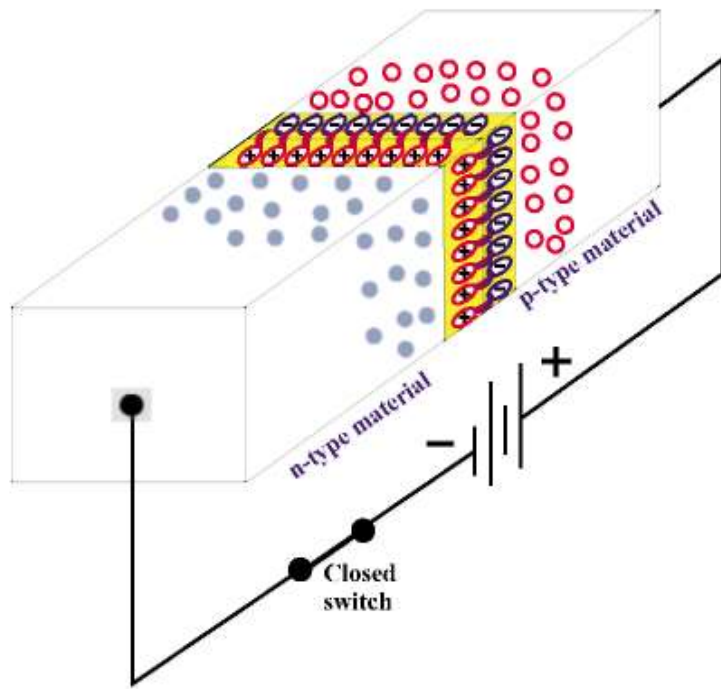




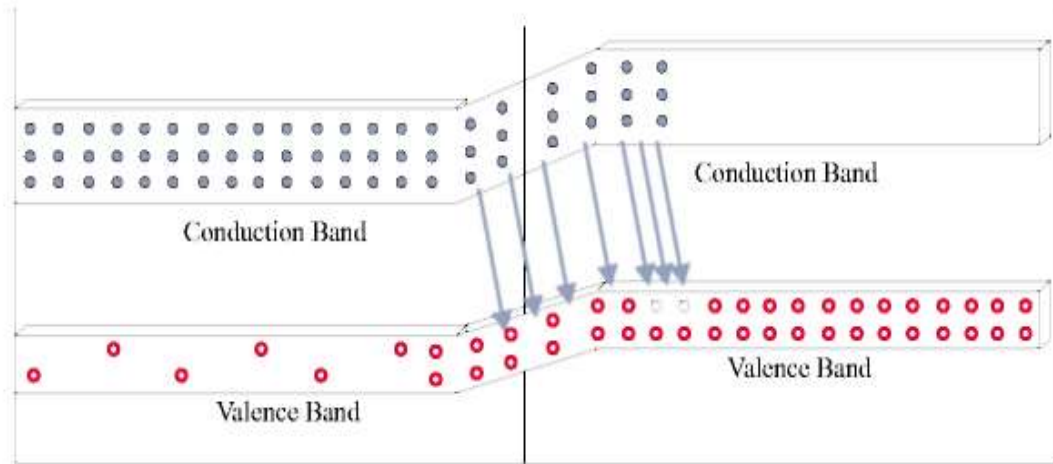
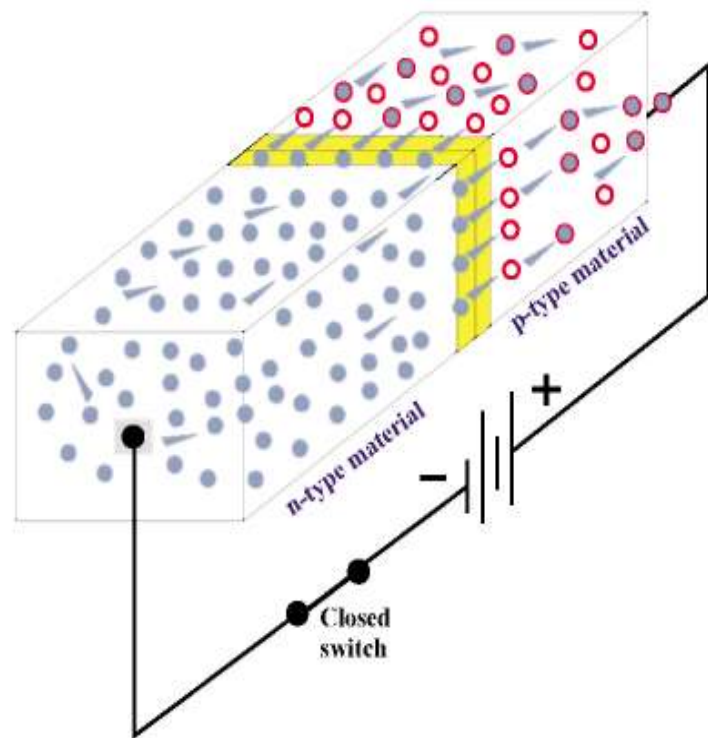


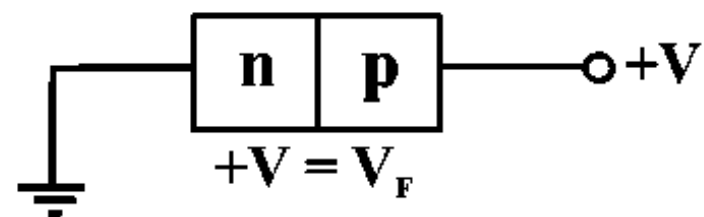
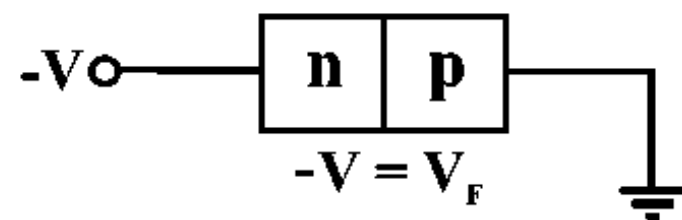


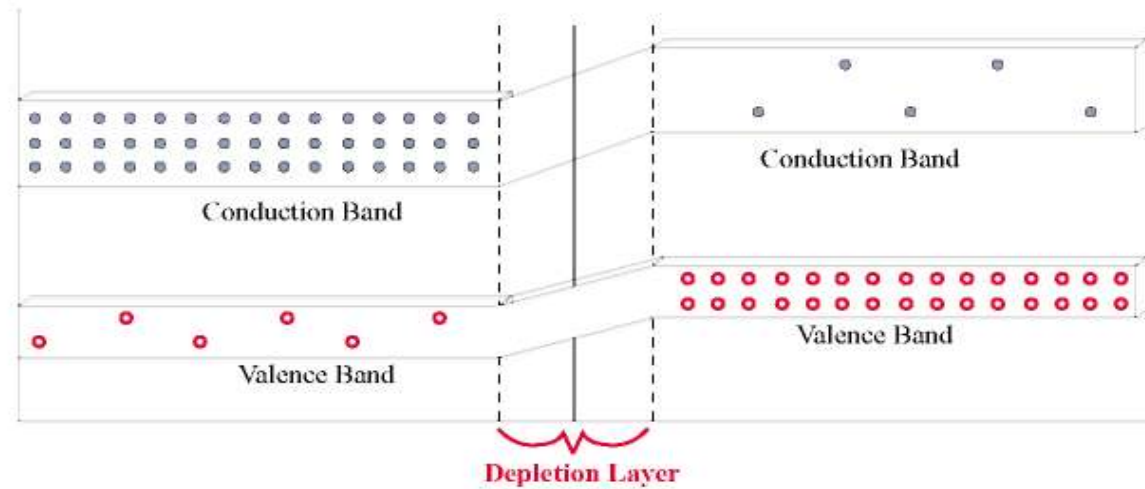
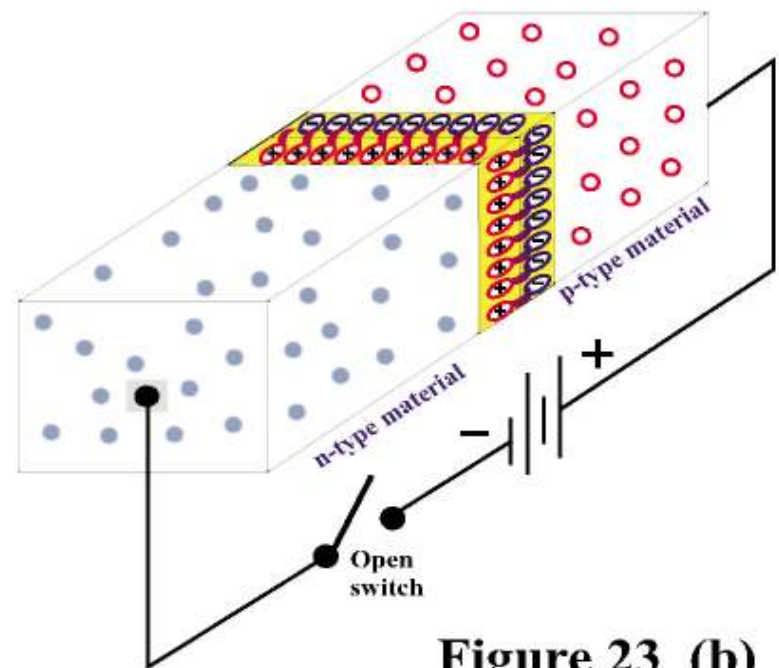
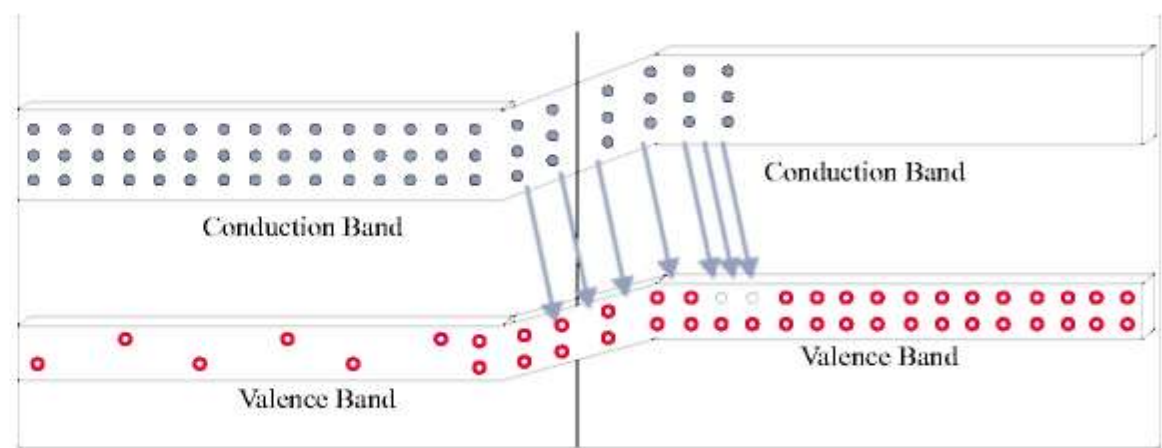
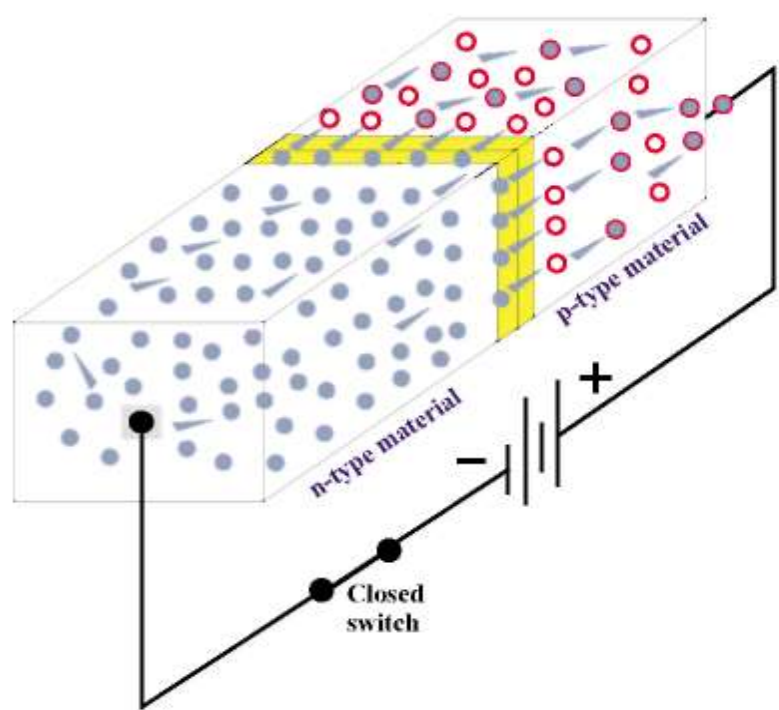




- - - - -







The depletion layer re-forms when the switch is opened and the diode returns to its un-biased state

The Depletion Layer returns - The unbiased Diode

Figure 23 (b)

