ELECTRIC CHARGE AND FIELD

CONDUCTORS AND INSULATORS

Charging by conduction (flow):

There are three types of material in nature

(i) **Conductor:**

Conductors are the material in which the outer most electrons are very loosely bounded, so they are free to move (flow). So in a conductors, there are large number of free electrons.

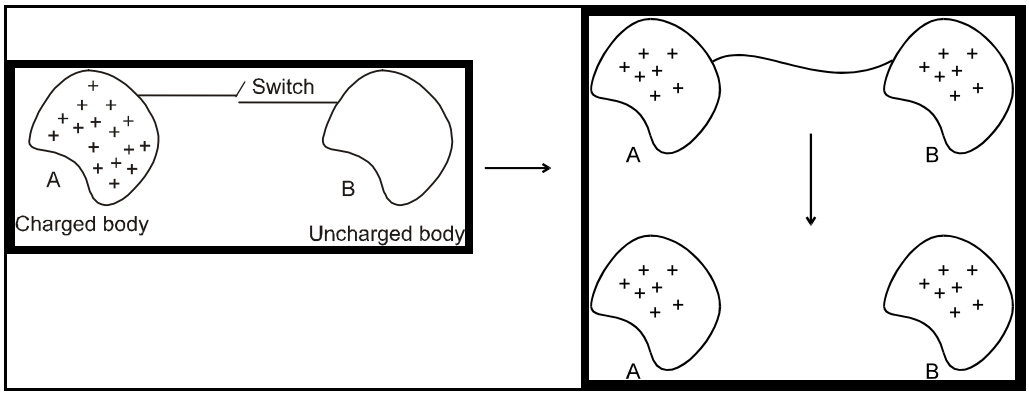
Ex. Metals like Cu, Ag, Fe, Al.....

(ii) **Insulator or Dielectric or Nonconductor:**

Non-conductors are the materials in which outer most electrons are very tightly bounded, so they cannot move (flow). Hence in a non-conductor there is no free electrons. Ex. plastic, rubber, wood etc.

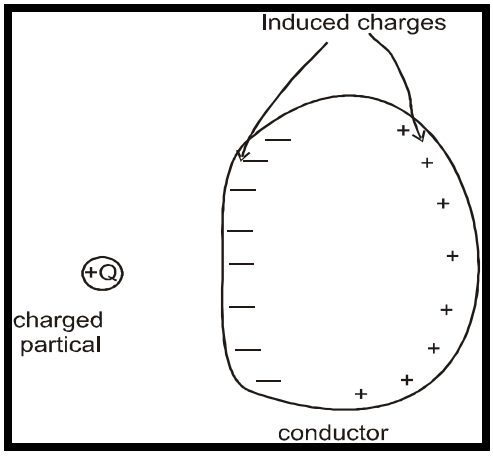
(iii) **Semi-conductor:**

Semiconductor are the materials which have free electrons but very less in number. Now lets see how the charging is done by conduction. In this method we take a charged conductor 'A' and an uncharged conductor 'B'. When both are connected some charge will flow from the charged body to the uncharged body. If both the conductors are identical & kept at large distance, if connected to each other, then charge will be divided equally in both the conductors otherwise they will flow till their electric potential becomes same. Its detailed study will be done in last section of this chapter.



Charging by Induction:

To understand this, let's have introduction to induction.



We have studied that there are lot of free electrons in the conductors. When a charge particle +Q is brought near a neutral conductor. Due to attraction of +Q charge, many electrons (–ve charges) come closer and accumulate on the closer surface.

On the other hand a positive charge (deficiency of electrons) appears on the other surface. The flow of charge continues till there is resultant force on free electrons of the conductor becomes zero. This phenomenon is called induction, and charges produced are called induced charges.