Chemical Effects of Current

Conductors:

Materials, which allow electric current to easily pass through them, are good conductors of electricity, e.g., *Metals*. Materials which don't allow electric current to pass through them are bad conductors of electricity, e.g., *Wood, Plastic etc*. Human body is a good conductor of electricity. Thus we should take precautions while handling electrical appliances. A material may conduct electricity but it may not conduct it as easily as a metal. As a result, the circuit of the tester may be complete and yet the current through it may be too weak to make the bulb glow.

Under certain conditions most materials can conduct. That is why it is preferable to classify materials as good conductors and poor conductors instead of classifying as conductors and insulators.

Note: *Distilled water is free of salts and is a poor conductor of electricity. Small amounts of mineral salts present naturally in water are beneficial for human health. However, these salts make water a good conductor. Hence we should not handle electrical appliances with wet hands or while standing on a wet floor.*

Most liquids that conduct electricity are solutions of acids, bases and salts

Electrolytic Setup:

Electrolyte:

It is a solution which allows electric current to flow through it. For example, molten metal, acid solutions etc.

When electric current is passed through an electrolyte, it decomposes.

Electrolysis:

It is the process by which an electrolyte is decomposed by the passage of electric current through it.

Electrolytic Cell:

Two electrodes are dipped into an electrolytic vessel containing electrolyte and connected to an external supply makes an electrolytic cell.

Electrode:

It is a conducting rod which is connected to an external current source i.e. the battery and is used for current flow through the electrolyte.

- **Anode:** It is an electrode which is connected to the positive terminal of the battery through which current enters the electrolyte. Hence, it is positively charged.
- **Cathode:** It is an electrode which is connected to the negative terminal of the battery through which current leaves the electrolyte. Hence, it is negatively charged.

Passage of an electric current through a conducting solution causes chemical reactions.

As a result any of the following activities can be observed.

(a) Formation of gas bubbles

(b) Deposit of metals on electrodes

(c) Change in color of the solution.

When electricity is passed through some substances they decompose. Such reactions are called electrolytic reactions. This chemical effect is used to extract elements in metallurgy and for electroplating.

Electroplating:

The process of depositing a layer of any desired metal on any other conducting substance by means of electricity is called electroplating.
Chromium plating is done to make the object scratch proof and appear shiny.
Tin cans, used to preserve food items / soft drinks are made by electroplating tin onto iron.
A coating of zinc is deposited on iron to protect it from corrosion and formation of rust.

Uses of electroplating:

i) It gives a finished surface. Hence, used for decorating purpose.
ii) Some metals are reactive and tend to get rusted. Electroplating such metal with a less reactive
metal serves as a protection.
iii) Generally, parts of machine which has suffered damage are repaired using welding. But welding
in case of fine article is not possible. In such cases electroplating is done.