

## CHAPTER 14: Chemical Effects of Electric Current

### ➤ **Conductors of electricity:**

1. Good Conductors: The materials, which allow electric current to pass through them, are good conductors of electricity. E.g.: Copper and aluminum conduct electricity
2. Poor Conductors: Materials, which do not allow electric current to pass through them easily, are poor conductors of electricity. E.G.: Rubber, plastic and wood do not conduct electricity.

### ➤ **Liquids as the conductors of electricity:**

- Some liquids are good conductors of electricity and some are poor conductors.
- Some material may conduct electricity, it may not conduct it as easily as a metal
- to check the above effect, the circuit of the tester may be complete and if still the current through it is too weak to make the bulb glow.
- Most liquids that conduct electricity are solutions of acids, bases and salts.
- When salt is dissolved in distilled water, salt solution is formed. This is a conductor of electricity.
- The water that we get from sources such as taps, hand pumps, wells and ponds is not pure.
- It may contain several salts dissolved in it.
- This water is thus a good conductor of electricity.
- Distilled water is free of salts and is a poor conductor.
- Small amounts of mineral salts present naturally in water are beneficial for human health.
- But these salts make water a good conductor.
- Care should be taken while handling electrical appliances with wet hands or while standing on a wet floor.

### ➤ **Chemical Effects of Electric Current:**

- The passage of an electric current through a conducting solution causes chemical reactions.
- Bubbles of a gas, Deposits of metals may be formed on the electrodes.
- Changes of color of solutions may occur.
- The reaction depends on what solution and electrodes are used.

### **I. Electroplating:**

#### ➤ Mechanism:

1. When electric current is passed through the copper sulphate solution, copper sulphate dissociates into copper and sulphate.
2. The free copper gets drawn to the electrode connected to the negative terminal of the battery and gets deposited on it
3. The other electrode, a copperplate, an equal amount of copper gets dissolved in the solution.
4. Thus, the loss of copper from the solution is restored and the process continues.
5. This means that copper gets transferred from one electrode to the other.

- The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating.
- It is a widely used process in industry for coating metal objects with a thin layer of a different metal which has a desired property, which the metal of the object lacks.
- For example,
  1. Chromium plating is done on many objects such as car parts, bath taps, kitchen gas burners, bicycle handlebars, wheel rims etc.
  2. Chromium has a shiny appearance, does not corrode, resists scratches.
  3. Chromium is expensive and it may not be economical to make the whole object out of chromium.
  4. Object is made from a cheaper metal and only a coating of chromium over it is deposited.
  5. Jeweler makers electroplate silver and gold on less expensive metals.
  6. In the electroplating factories the disposal of the used conducting solution is a major concern. It is a polluting waste and there are specific disposal guidelines to protect the environment.