Revision Notes for Class 8 Science

Chapter 11 – Chemical Effects of Electric Current

Conductors and Insulators:

1. Electrical conductivity describes the ease with which current can flow in a material.

2. Materials in which it is very difficult for the current to flow through them are called poor conductors of electricity. They have a very low value for electrical conductivity. In general, non-metals are poor conductors of electricity.

3. Materials in which current can flow easily are said to be good conductors. In solids, metals and graphite are considered to be the good conductors of electricity. They have high electrical conductivity values.

Liquid Conductors:

1. Like solids, some liquids can also conduct electricity. Pure or distilled water is a poor conductor but when some impurities like salts, bases or acids are dissolved in water then it starts conducting electricity.

2. Such substances which when dissolved in water act as a conductor are called electrolytes. Acids, bases and salts are the examples of electrolytes. These substances are made when two oppositely charged ions are combined to form a compound. Ions are atoms or molecules that carry either positive or negative charge. When they are dissolved in suitable solvents such as water then they are dissociated into their respective ions which become free to conduct electricity.

3. Certain substances like acids, bases and salts when dissolved in water then the water starts conducting electricity. This results in some chemical changes like bubbles may form at the electrodes due to evolution of gases or the colour of a solution may change. This is called the chemical effects of electric current.

Electrolysis:

i. When current is passed through an electrolytic solution then a chemical change is observed resulting in the dissociation of electrolytes into their constituent ions. This process is called electrolysis.

ii. For electrolysis to occur a setup called electrolytic cell is required. This cell contains electrodes which are usually metal rods, they are dipped inside an acidic, basic or salt solution to complete a circuit containing liquid conductors. These electrodes are connected to batteries and a switch in between. A battery has positively and negatively charged terminals. Based on which terminal an electrode is connected it is classified as cathode (when connected to negative terminal) and anode (when connected to positive terminal)

Some Applications of Electrolysis:

i. It is used in the extraction and purification of some metals. The process is called electrorefining.

ii. It is used in electroplating.

Electroplating:

i. Electroplating is the process of coating a material with a layer of any desired metal using electric current.

ii. A sample that has to be coated is placed as the cathode in the electrolytic cell and a desired metal which is to be deposited on the surface is placed as an anode.

Uses of Electroplating:

i. Chromium metal is electroplated on car parts, bath taps, kitchen gas burners etc.

ii. Electroplating of gold and silver is done on some less expensive metals.

iii. Electroplating of tin is done on iron as tin is less reactive.

iv. Electroplating of zinc on iron prevents it from corrosion.

Some Other Phenomenon of Current:

1. When the current is passed through the filament of the bulb it becomes hot and starts glowing due to the heating effect of the electric current.

2. When a compass is brought near a wire conducting electricity, the needle of the compass is deflected which indicates the presence of current in the wire. This is called the magnetic effect of electric current.

Chemical Effects of Electric Current

Chemical reactions take place when the current is passed through chemical solutions. Some of the chemical effects which take place as a result are:

- Release of gas bubbles at electrodes.
- Metal deposition at electrodes.

Change in the colour of the solution.

Electric Circuit:

The path which a current takes in a closed-loop circuit is called an electric circuit. When the switch is closed, i.e., the current can flow through it, electricity is conducted. Although, when the switch is open, i.e., there is a break in the circuit's path, then no conduction of electricity takes place.

Tester:

To check the presence of electric current in a circuit, an electric component named tester is used. It contains an led bulb, which helps in indicating the presence of an electric current.

Conducting Liquids:

In the case of liquids, if salts are dissolved in it, they conduct electricity. The majority of the liquids which conduct electricity are the solutions of acids, bases, or salts.

Acids, Bases, and Salts:

Acids and bases are usually good conductors of electricity because they contain ions. When dissolved in a solution, they dissociate to form ions.

Electricity Conduction in Water:

Water starts the electricity conduction when acids, bases, or salts are dissolved in it, and a potential difference is applied across it.