

SUMMARY

Conductivity of Liquids

We can use a **tester** to check if electricity is flowing through a wire in a circuit. If the bulb in the tester glows, it indicates that current is flowing through the wire; else, current does not exist. Electrical **conductivity of liquids** can be explained by a simple activity of taking a liquid, like lemon juice, in a container, inserting electrodes in it, connecting the two electrodes to the terminals of a battery with a bulb between them. The bulb glows, indicating that lemon juice is a conductor of electricity. Several liquids can be checked for electrical conductivity in the same way.

We find that liquids like **lemon juice, liquid soap, rain water, salt solution**, etc. conduct electricity, whereas liquids like **distilled water, oil**, etc. do not conduct electricity. The materials that conduct electricity are **conductors** and those that do not conduct are called **insulators**. When electricity is passed through a conducting solution, the molecules of the solution dissociate into ions, which cause electrical conduction through the liquid. This process is due to the **chemical effect of electric current**.

Chemical Effect of Electric Current

The most common application of the **chemical effect of electric current** is **electroplating**. In this process, there exists a liquid, usually called the electrolyte, through which current passes. Two **electrodes**, connected to the terminals of a battery with a switch in between, are inserted in the liquid. The electrode that is connected to the positive terminal of the battery is called the "anode," and the other connected to the negative terminal is called the "cathode".

Electroplating is done in industries to have an **anti-reactive** coating on the parts of machines so that they do not react with the raw material, to have an **anti-corrosive** coating for the machines so that they do not get corroded, and a **heat-resistive** coating for parts like boilers to resist the heat produced by the machinery.

Gold plating is one of the most common applications of electroplating in ornament-making. In electroplating, the solution gets dissociated into its respective ions. The positive ions are called cations, and the negative ions are called anions.

The current in the solution is due to the flow of these ions. The anions move towards the anode, and the cations move towards the cathode. The cations are converted into atoms at the cathode and form a layer on it, which we call electroplating. To compensate for the loss of ions in the solution, the atoms of the anode dissociate into the solution, forming the ions.

The process of electroplating is used for plating parts of vehicles with nickel and chromium, which protects them from corrosion.