

CLASS VIII - 8 SCIENCE

CHAPTER 14 : CHEMICAL EFFECTS OF ELECTRIC CURRENT

MODULE -1 HAND OUT

Good Conductors of Electricity:

The materials which allow the current to pass through them are known as good conductors. Examples are copper, aluminium, etc.

Poor Conductors of Electricity:

The materials which do not allow the current to pass through them easily, are known as poor conductors. They are also called as insulators. Examples are glass, plastic, etc.

TESTER

It is a device used to test if a particular material allows electric current to pass through it or not.

A simple conduction tester has an electric cell and a torch bulb. One terminal of the cell is connected to one terminal of the bulb by a wire. The other terminal of the cell and bulb have wires which can be brought in contact with materials to test whether they are good or poor conductors of electricity.

If the material is a good conductor, the bulb glows, if it is a poor conductor, the bulb does not glow.

Conductivity in Liquids:

A tester can be used to check if a liquid is conducting or non-conducting.

To check if the liquid is conducting or not, connect the liquid between the two ends of tester by completing the connection of the circuit properly. Instead of using cell, a battery can be used.

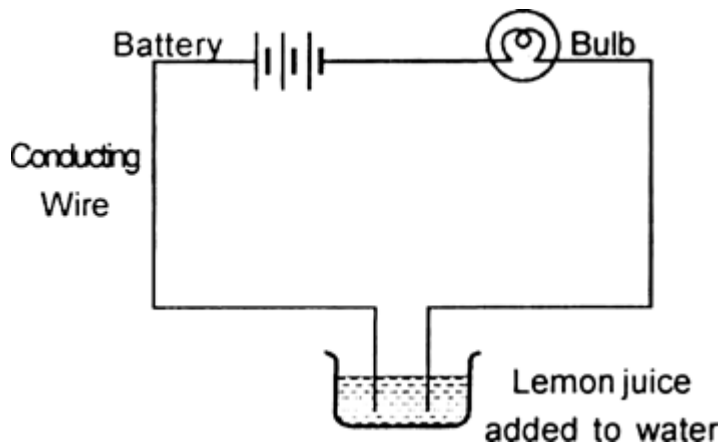
When the liquid between the two ends of the tester allows the electric current to pass, the circuit of the tester becomes complete. The current flows in the circuit and the bulb glows. , it means the liquid is conducting .

When the liquid does not allow the electric current to pass, the circuit of the tester is not complete and the bulb does not glow, then it means liquid is non-conducting

Testing conduction of electricity in lemon juice/ vinegar

Collect a few small plastic or rubber caps of discarded bottles and clean them. Pour one teaspoon of lemon juice or vinegar in one cap. Bring the tester over this cap and let the ends of the tester dip into lemon juice or vinegar as shown in figure. Take care

that the ends are not more than 1 cm apart but at the same time do not touch each other.



Now you can see that the bulb of the tester glows.

So lemon juice or vinegar is a good conductor of electricity

Effects of electricity

- Heating effect
- Magnetic effect
- Chemical effect

Heating effect of current:

Heating effect can be used for testing the conductivity of a liquid

The heating effect of current is responsible for the glowing of the bulb.



Mechanism of glowing of bulb

When current passes through the bulb, the filament gets heated to a high temperature and as a result bulb starts glowing. But, if current is very small then the filament will not get heated to a high temperature and so will not glow.

There are some situations in which even though liquid is conducting, the bulb may not glow. The possible reasons may be

- * The current may be weak
- * Bulb may be fused
- * Incomplete circuit

LED (Light Emitting Diodes)



LED's can be used to detect weak currents, since their filament does not require much temperature to glow.

They have two terminals called anode and cathode. The length of anode lead is slightly longer than the cathode lead and is always connected to the positive terminal of the battery. On the hand, cathode lead is shorter and is connected to the negative terminal of the battery.

Magnetic effect of current:

The magnetic effect of current is responsible for the deflection in magnetic compass when current passes nearby it. It can detect weak currents.

Magnetic effect can be used for testing the conductivity of a liquid

For a closed circuit, when current passes nearby a magnetic needle and if the deflection is observed in the needle then it means the substance is conducting; otherwise it is non-conducting.

Tester By using Magnetic Compass:

- i) Take the tray from inside a blank matchbox.
- ii) Wrap an electric wire a few times around the tray.
- iii) Insert a small compass needle inside it.
- iv) Now connect one free end of the wire to the terminal of a battery. Leave the other end free.
- (v) Take another piece of wire and connect it to the other terminal of the battery.
- vi) Join the free ends of two wires momentarily.

The compass needle should show deflection.

Tester with two free ends of the wire is ready.



Touch the both ends of tester to any substance to check whether the substance is conducting the electricity or not. If the deflection is observed in the needle then it means the substance is conducting; otherwise it is non-conducting

We can check the conductivity of tap water or distilled water via the magnetic tester.

Tap Water:

The water obtained from various sources like rivers, wells, taps, etc. is not in its purest form. It contains many impurities in it. These impurities include different salts too. As a result of these salts, the tap water becomes a good conductor of electricity.

Distilled Water:

It is the purest form of water and does not contain any kind of impurities in it. Hence, it is a poor conductor of electricity

Identification of good & poor conducting liquids by using magnetic effect of electric current

Material under test	Compass Needle Shows Deflection Yes/No	Good Conductor/Poor Conductor
1. Lemon juice	Yes	Good Conductor
2. Vinegar	Yes	Good Conductor
3. Tap Water	Yes	Good Conductor
4. Vegetable oil	No	Poor Conductor
5. Milk	Yes	Good Conductor
6. Honey	No	Poor Conductor
7. Distilled water	No	Poor Conductor
8. Blood	Yes	Good Conductor
9. Salt water	Yes	Good conductor
10. Sugar solution	No	Poor conductor

Can all liquids conduct electricity?????

*Not all liquids can conduct electricity. However, some of them can be regarded as good conductors of electricity while others as poor conductors of electricity.

*Water containing salts and minerals dissolved in it always conduct electricity. eg: Water get from taps, hand pumps, wells & pond.

*Distilled water which does not contain any salts cannot conduct electricity.

*Any solution of acids or bases can also conduct electricity.
