

## SCIENCE AND NATURAL PHENOMENA

### MATTER :

Anything which occupies space and has volume.

MASS : is defined as the matter present in the body.

CHARGE : is defined as the intrinsic property of the matter. It is categorized into three: Protons, electrons and neutron.

In an atom number of proton is always equal to number of electron.

During charging a body either gains or losses electron.

**If an atom loses electron then there is more amount of protons left in the atom , hence it is defined as the Positively charged ions whereas the other body which gains the electron is termed as the Negatively charged ion.**

ELECTRICITY is divided into two forms: **STATIC** and **CURRENT**.

**STATIC** electricity involves electric charges that collect at one place and remains stationary.

The study of static electricity is called **ELECTROSTATIC**.

**CURRENT** electricity involves flow of charges through wires.

### **Existence of charges:**

In a body certain particles carry positive charges known as **PROTONS**; some of the particles carry negative charge called as **ELECTRONS**.

Electrons can move from one place to another but Protons cannot move.

## NOTE:

**When an atom loses one or more electron it becomes positively charged.**

**When an atom gains one or more electron it becomes negatively charged.**

## PROPERTIES OF THE CHARGE:

1. Like charges repel each other.
2. Unlike charges attract each other.

## ACTIVITIES :

1. Rub a glass rod with a silk cloth. on rubbing silk cloth acquires the charge whereas glass rod loses the electrons. Hence, glass rod becomes positively charged and silk becomes negatively charged.
2. Rub an ebonite rod with a woolen cloth, on rubbing woolen cloth loses the electron whereas ebonite rod gains the charge. Hence, ebonite rod becomes negatively charged and woolen cloth becomes positively charged.

## QUESTION:

Try one or more activities and record your observations.

## SURE TEST FOR CHARGING:

REPUSION between two bodies is considered as the sure test of presence of charge on both the bodies.

## TRANSFER OF CHARGES

The body which gains free electron becomes negatively charged.

The body which loses free electron becomes positively charged.

#### NOTE:

The electrification due to positive charge is not because of transfer of protons, but due to deficiency of electrons.

Example:

1) When glass rod is rubbed with silk, electrons from glass rod are transferred to silk. Because, in glass the electrons are loosely bound than in silk.

Thus, due to deficiency of electrons, glass rod becomes positively charged, but due to gain of equal number of electron, silk becomes negatively charged.

2) When an ebonite rod is rubbed with fur, the electrons from fur are transferred to ebonite rod.

The ebonite rod becomes negatively charged due to gain of electrons while fur becomes positively charged due to deficit of same number of electrons.

#### Electroscope:-

It is a device which is used to detect and test small electric charged developed on a body.

A gold leaf electroscope is very sensitive and presence of even minute amount of charge on a body can be detected.

#### Different ways of charging:-

i) Charging by rubbing:- When 2 bodies are rubbed against each other, they acquire equal and opposite charges.

- ii) Charging by conduction:- A neutral body can be charged by bringing it in contact with a charged body. Here, some charge from charged body gets transferred to uncharged body.
- iii) Charging by Induction:- An uncharged body can be charged by bringing a charged body near it, but not touching it.

When you bring ebonite rod (negatively charged) near to sphere A, negative charges inside A move as far as possible. Some of them cross over to sphere B, leaving net positive charge on A. When sphere B is moved away in presence of ebonite rod. It retains negative charges.

Gold leaf electroscope is used to detect measure and find the nature of charge.

Note:-

First charge the electroscope with a known charge. If the body to test is negatively charged, it will increase the charge on the leaves, making them diverge more. Increase in distance between the leaves indicate that the body to be tested is almost negatively charged.

If the body to be tested is positively charged, it will decrease the charge on leaves, forcing them to come closer. Decrease in the distance between the leaves indicate that body to be tested is oppositely charged, positive charge.

Lightning:-

It is the spectacular bluish white flash of light produced in the clouds. Lightning is caused by discharged of electrical charges in rain bearing clouds. Oppositely charged clouds exert a strong force of attraction between them. An electric discharge can occur not only between 2 clouds but also between a charged cloud and the Earth.

## Earthing: -

Transfer of charge from a charged body to earth. The body, from which charge has been earthed, loses charge on it. Such a body on losing charge on it is called **Discharge**.

Earthing means connecting an object to the earth by means of a conductor. So that the object may share its charge with the earth.

Lightning strikes tall buildings and passes to ground much easily. Lightning conductors are used to protect buildings from lightning. Lightning conductor is a metallic strip running under earth to top of building, which is to be protected.

Thunder:- Loud sound followed by a flash of lightning.

## EARTHQUAKE

The relative movement of different parts of the lithosphere producing high intensity shock waves.

The point from where the shockwaves of an earthquake originate due to sudden movement of rocks is termed as **SEISMIC FOCUS** or **SEISMIC ORIGIN** or **HYPOCENTER**.

The point above seismic focus is called as **EPICENTRE**.

The instrument used to detect and record the intensity of seismic waves generated by an earthquake is called **SEISMOGRAPH**.

**RICHTER SCALE** is used to describe the magnitude of an earthquake.

Causes of an earthquake are:

1. Volcanic eruptions
2. Man made explosions
3. Dislocation of the crust
4. Movement of tectonic plates

