

Static Electricity : Notes-10

Brief Notes.

The Greek scientist (and mathematician), Thales (600 B.C.), noticed that when a piece of amber was rubbed with fur, it would pick up bits of straw. The Greek word for amber is "electron".

Amber is the hardened resin from coniferous trees. It is similar to modern plastics like vinyl.

The English scientist, William Gilbert, (1544-1603) found that many materials when rubbed, could be "electrified" (or **charged**). They will then attract other materials. Gilbert also found that metals could not be electrified. (metals can be electrified if they are insulated but Gilbert did not know this)

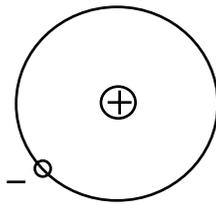
French scientist, Charles Du Fay, (in the early 1800's) rubbed glass rods with silk and found that two glass rods would repel each other. He found that two pieces of amber would repel each other when rubbed with fur. He also found that rubbed glass would attract rubbed amber. Du Fay assumed that there must be two types of electricity.

Ben Franklin named the two types of electricity, **positive** (+) and **negative** (-).

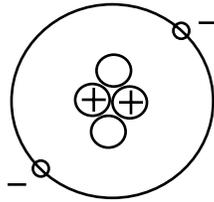
The Atom

We now know that the electrification or charging of objects occurs because of the structure of the atom.

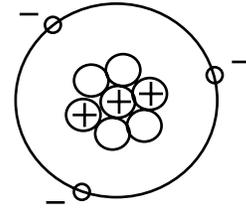
Atoms are composed of **electrons**, **protons**, and **neutrons**. There is an attractive force between electrons which are negatively charged and protons which are positively charged. Neutrons have no charge. The protons and neutrons are the same size and are located in a central **nucleus**. They do not move. Electrons are much smaller than protons and move about this nucleus. A few atoms are shown below.



Hydrogen

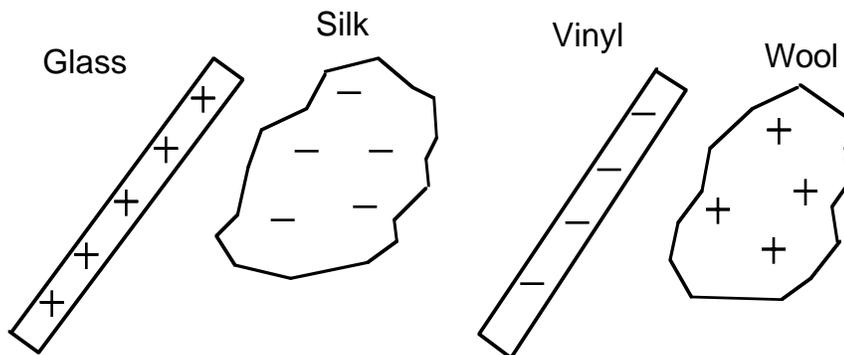


Helium



Lithium

The electrons can be removed from atoms because of their small mass. Some materials are more attractive to electrons than others. When amber (or vinyl) is rubbed with fur (or wool), the fur donates electrons to the amber. When glass (or acetate plastic) is rubbed with silk, the silk removes electrons from the glass, because the silk is more attractive to electrons.



When an object is charged positive, it has a deficit of electrons. If an object is charged negative, it has an excess of electrons. If an object is neutral, the number of electrons is equal to the number of protons.

Law of Electric Charges

- 1) Opposite charges attract.
- 2) Similar charges repel.
- 3) Any charged object will attract a neutral object.