

Science

Class-VI

Chapter-7

Properties of matter and external effect

Subject teacher- Syeeda Sultana

Lecture sheet with worksheet-3

Date-22.10.2020

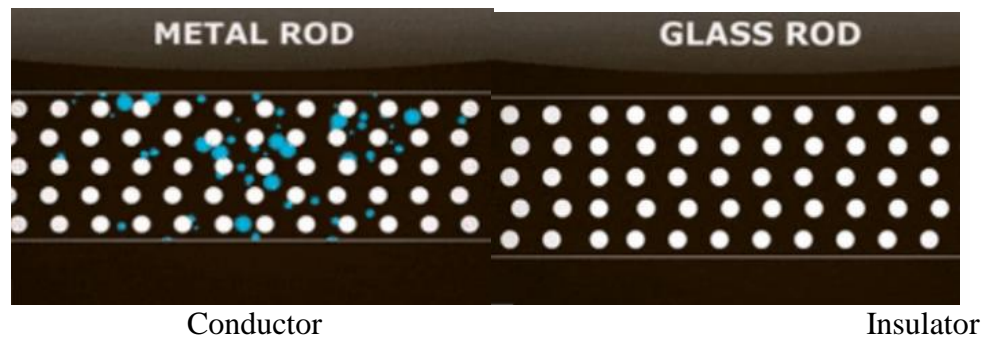
Properties of metal: Electrical conductivity of metals

Conductors and insulator:

In a conductor, electric current can flow freely. In an insulator, it cannot. Metals such as copper, aluminium are conductors, while most non-metallic solids are said to be good insulators, having extremely high resistance to the flow of charge (negatively charged electron) through them. The atoms in the metals form a special structure through which some of its electrons can move freely. These electrons are no longer firmly held by a specific atom. Metals are good conductors of electricity. Most nonmetal atoms hold on to their electrons tightly and are insulators.

*Electrons are negatively charged tiny atomic particles those present inside atoms.

*Electricity is the flow of electrons through a conductor.



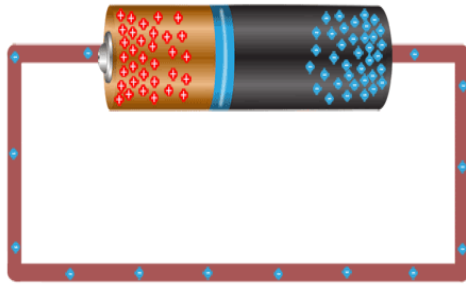
- ❖ If we connect a battery with a bulb through two copper wires, the electrons will flow from the negative terminal to the positive terminal of the battery. And that means there will be flow of current electricity from positive end to negative end. And in metals (Cu) freely movable electrons are present those can conduct electric current.
- ❖ Now break the circuit from anywhere by cutting the copper wire. Now look at the broken part, there is nothing present in this part that can transfer the electrical energy from one side to other. But there is air. So, we can say air is an insulator. If we connect the two wires by a glass or plastic. Then what will happen?



Complete circuit

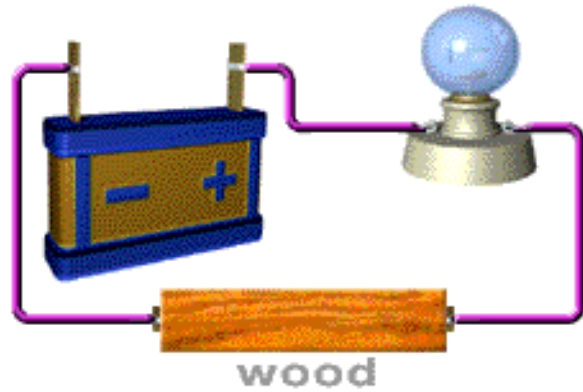
incomplete circuit

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← Direction of electron flow

(Conventionally, direction of current is shown from positive to negative)

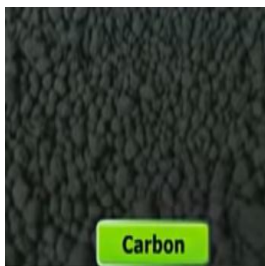


- ❖ You might have noticed that electricians use an electric tester that has a plastic insulation at the touching or holding end. Why is it so? A tester is insulated by plastic to protect the holder from electric shock, as it is a bad conductor of electricity

❖ **Non-metals:**

A non-metal is an element that is neither malleable nor ductile and does not conduct electricity and heat.

Usually nonmetals do not show any metallic properties.



Carbon



Sulphur



Bromine

❖ **Comparison between metals and nonmetals:**

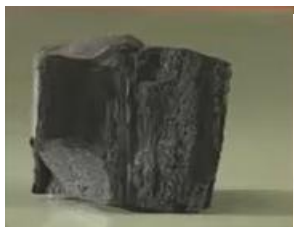
Metals	Non-metals
1. Lustrous (shiny)	1. Dull, not lustrous (not shiny)
2. Usually solids at room temperature (except mercury)	2. Solid, liquid or gas at room temperature
3. High melting and boiling points	3. Low melting and boiling points
4. High densities	4. Low densities
5. Sonorous	5. Non sonorous
6. Malleable	6. Not malleable (Brittle)
7. Ductile	7. Not ductile
8. Good conductors of heat and electricity	8. Good conductors of heat and electricity

Compressive Exercise:

These questions are about metals and nonmetals.

- How exactly is the current flowing in the circuit?
- Through which material is the current flowing?
- What is nonmetal?
- Make a comparison between metals and nonmetals.
- In which of the states do the particles have highest density?
.....
- What is the physical state of mercury?
.....
- In which of the states do the particles just vibrate?
.....
- Which of the state is the common form of metals?
.....

1.



Coal

Copper

Which one of the figure above is used for preparing electric wires? Explain your choice.

.....
.....
.....
.....
.....
.....
.....
.....

2. Copy the words below to answer the following questions.

[you are given some unnecessary words]

Negatively, electrons, tightly, specific atom, inside, electricity, positive, protons, molecules

The atoms in the metals form a special structure through which some of its can move freely. These electrons are no longer firmly held by a
Metals are good conductors of Most nonmetal atoms hold on to their electrons and are insulators. Electrons are charged tiny atomic particles those present atoms.