

CHEMISTRY STUDY MATERIALS FOR CLASS 10

(NCERT Based notes of Chapter -03)

GANESH KUMAR

DATE:- 24/05/2021

METALS AND NON-METALS

REACTION OF METAL AND NON-METAL

Many metals form ionic bonds when they react with non-metals. Compounds so formed are known as ionic compounds.

Ions: Positive or negative charged atoms are known as ions. Ions are formed because of loss or gain of electrons. Atoms form ion to obtain electronic configuration of nearest noble gas, this means to obtain stable configuration.

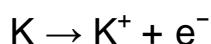
Positive ion: A positive ion is formed because of loss of electrons by an atom. Following are some examples of positive ions.

Examples:

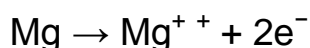
- Sodium forms sodium ion because of loss of one electron. Because of loss of one electron; one positive charge comes over sodium.



- Similarly; potassium gets one positive charge by loss of one electron.



- Magnesium forms positive ion because of loss of two electrons. Two positive charges come over magnesium because of loss of two electrons.



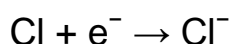
- Similarly calcium gets two positive charges over it by loss of two electrons.



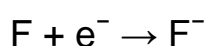
Negative ion: A negative ion is formed because of gain of electron. Some examples are given below.

Examples:

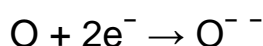
- Chlorine gains one electron in order to achieve stable configuration. After loss of one electron chlorine gets one negative charge over it forming chlorine ion.



- Similarly, fluorine gets one negative charge over it by gain of one electron forming fluoride ion; in order to achieve stable configuration.



- Oxygen gets two negative charge over it by gain of two electrons forming oxide ion; in order to obtain stable configuration.



USES OF METALS

Metals find number of applications. Some of them are given below.

- Zinc metal is used for galvanizing iron, in anti corrosion material, in medicinal fields and in alloys.
- Iron is used as a construction material in bridges, houses, ships etc. Iron, in the form of steel is used for making domestic utensils.
- Tin is used for soldering, for preparing foils, for metal coatings to prevent chemical action and corrosion, for panel lighting etc.
- Lead is used in making water pipes, in pigments, batteries, in alloys etc.
- Titanium finds extensive use in aircraft industries
- Almost all metals including Zr, Ti find wide applications in atomic and space programmes and experiments.

- Pure metals, which display zero resistance to electrical currents, are called superconductors. Hg, Nb are examples of superconductors. They become superconductors below a critical temperature of 4.2 K and 9.2 K respectively. Superconductors have many applications in research and industry.
- Mercury is used in thermometers.
- Silver, gold and platinum are precious metals and they are used in making ornaments.
- Radioactive metals like uranium and plutonium are used in nuclear power plants to produce atomic energy via nuclear fission.

USES OF NON - METALS

Non - metals find number of applications. Some of them are given below.

- Sulphur is used in making compounds like sulpha drugs, sulphuric acid, in matches, in gun powder, for vulcanization of rubber etc.
- Boron, in the form of compound borax, is used in making skin ointments.
- Phosphorus is used in making crackers.
- Oxygen is used for respiration.
- Chlorine, in the form of bleaching powder, is used for purification of water.
- Carbon is used as a fuel, as electrodes (graphite), as a reducing agent in metallurgy.
- Oxygen, hydrogen and nitrogen are used by all living things; they are the 'building blocks' of life.
- Iodine is used to prevent thyroid problems.
- Bromine is used in the preparation of dyes.
- Some compounds of fluorine (such as sodium fluoride, stannous fluoride) are added to toothpastes to prevent dental decays or formation of cavities.
