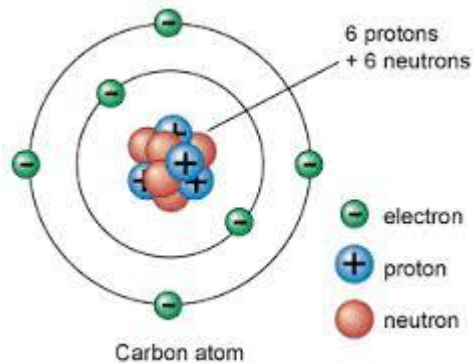


ELEMENTS OF AN ATOM



1. ATOM

Atom is an element defined as a substance which cannot be decomposed into other simpler substance. This is the smallest particle of an element which takes part in a chemical reaction. The number of electrons of any atom are same as the number of protons.

2. NUCLEUS

The atom consist of two distinct regions. The tiny central core is called the nucleus with a radius of more or less equal to 10^{-15} m and the extensive surrounding space is called outer sphere with radius of 10^{-10} m . Every atom is made up of three different particles called Proton, Neutron and Electron. The electron exist in the outer most orbit and the Proton and Neutron will be in Nucleus.

3. SUB NEUCLEONS

Proton and Neutron is elementary particle but they are composite particles. The indivisible basic fundamental constituent of a matter is considered as the quarks. These quarks are different in colour, flavour, strangeness and charm, etc.

4. OUTER SPHERE

The space around the nucleus is called outer sphere. It is divided into different of orbits.

According to Dalton's Theroy

1. All atoms of one element are precisely alike, have same mass but it differs from the atoms of other elements.
2. The chemical combination consists of the union of small fixed number of atoms of one element with a small fixed number of other elements.

The sum of any substance consists of **+ charged** nucleus and the **- charged** electrons orbiting around the nucleus. The nucleus consist of Protons and Neutrons. The neutrons has mass but neutral electric charge. The proton also posses a mass but they carry positive charge that is equal and opposite to that of electrons.

Atom is considered as neutral since number of proton and the number of electron are equal and as they posses opposite charges.

Any **addition of electrons** to the neutral atoms makes the atom **negatively charged** since electrons are negatively charged particles. Similarly **any subtraction of electrons** makes the neutral atom as **positively charged** since positively charged protons are more in the atom. Thus **charged atoms** are called **ions**. These type of **charging the atoms** are called **ionization**.

ATOMIC NUMBER AND MASS NUMBER

The number of protons in the Nucleus is called **ATOMIC** Number. It is denoted by letter **Z**. Both the proton and neutron are called nucleons since it occupies nucleus of an Atom. Total number of nucleons in a nucleus is called **MASS** Number. It is denoted by letter **A**.

A nuclear symbol is written conveniently as Z^A

Difference between Mass Number and the Atomic Number gives the number of Neutrons **N** in Nucleus of an Atom.

Nuclear Stability

Some nuclides are **Stable** and some nuclides are **Unstable or Radioactive**.

Isotopes

Some elements exist in different forms. **Mass number** is different for this **different forms** but the **atomic number is same**. They are known as the **isotopes of the element**. Normally number of protons and number of electron in an atom **are same**. But in some case number of electron and the number proton vary and exist. These atoms are **mostly unstable**. These atoms are called **Isotopes**.