

These orbits or shells are called energy levels. These orbits or shells are represented by the letters K,L,M,N,... or the numbers, $n=1,2,3,4,....$

#NEUTRONS

Neutrons are present in the nucleus of all atoms. In general, a neutron is represented as 'n'. The mass of an atom is therefore given by the sum of the masses of protons and neutrons present in the nucleus.

#How are Electrons Distributed in Different Orbits

The following rules are followed for writing the number of electrons in different energy levels or shells:

- (i) The maximum number of electrons present in a shell is given by the formula $2n^2$, where 'n' is the orbit number or energy level index, 1,2,3,....
- (ii) The maximum number of electrons that can be accommodated in the outermost orbit is 8.
- (iii) Electrons are not accommodated in a given shell, unless the inner shells are filled. That is, the shells are filled in a step-wise manner.

First shell or K shell can have $= 2n^2 = 2 \times 1^2 = 2 \times 1 \times 1 = 2 \text{ electrons}$

Second shell or L shell can have $= 2n^2 = 2 \times 2^2 = 2 \times 2 \times 2 = 8 \text{ electrons}$

Third shell or M shell can have $= 2n^2 = 2 \times 3^2 = 2 \times 3 \times 3 = 18 \text{ electrons}$

Fourth shell or N shell can have $= 2n^2 = 2 \times 4^2 = 2 \times 4 \times 4 = 32 \text{ electrons}$
and so on.

Valency

The electrons present in the outermost shell of an atom are known as the valence electrons. Valency is the combining capacity of an atom of an element. If an atom's outermost shell is completely filled, they are inert or least reactive and their combining capacity or valency is zero.

Of the inert elements Helium atom has 2 electrons in the outermost shell and the atoms of other elements have 8 electrons in their outermost shell. Atoms having 8 electrons in their outermost shell is having octet configuration and are stable. If an atom's outermost shell is not completely filled it is not stable. It will try to attain stability by losing, gaining or sharing electrons with other atoms to attain octet configuration.