

Introduction

Matter: Everything occupies a place in space and has a mass.

Atom: The smallest particle in the substance is involved in the chemical reaction.

The smallest part of a substance that can exist individually may consist of more than one atom called the molecule. If the molecule of matter contains similar atoms, it is an element, but if it contains atoms for different elements it is a compound.

Molecular: the smallest part of the material carries the properties of that matter.

Atomic number = number of protons

Number of mass = number of protons + number of neutrons

Then number of mass = atomic number + number of neutrons

Number of neutrons = number of mass - atomic number

Example: The atomic number of carbon equals 6 and the mass number is equal to 12, Find the number of neutrons in the carbon atom?

Answer:

Number of neutrons = number of mass - atomic number

Number of neutrons = $12 - 6 = 6$

Group	Number of Proton	Number of Mass	Number of neutron
^{14}N	7	14	7
^{39}K	19	39	20
^{20}Ne	10	20	10
^{23}Na	11	23	12

Electronic structure of the atom

Before the arrival of the scientific of Bohr and several other scientists, the predominance of the electronic structure of the atom was wrong until the scientific chemical came that's name Bohr and developed a theory named after it related to the electronic composition of the atom formerly known as classical theory.

Classical theory

One of the drawbacks of this theory is its interpretation. The electron is considered to lose energy when it revolves around the nucleus because of the force of attracting the nucleus. Therefore, it will move a helical movement and thus the atoms will gradually fade until the world comes to light and develop the theory which states as follows:

Bohr Theory

1. The atom consists of a nucleus surrounded by electrons.
2. Electrons rotate around the nucleus in specific circular orbits.
These orbits have a specific radius, so these orbits have specific energy.
- 3-The energy of the level increases by increasing the distance from the nucleus. For example, the first main energy level is less energy than the second energy level, so the electron moves between energy levels when it is gain or loses energy.

Quantum theory

The orbits can be named according to a quantitative number, which is the principle quantum number (n) and takes positive integers equal to 1, 2, 3, 4, 5, 6, 7 and each denotes a certain energy level and does not take n (zero).

Atom shell : K, L, M, N, O, P, Q

The value of n : 1, 2, 3, 4, 5, 6, 7



Increase energy

The greater the value of n , the greater the distance away from the nucleus and the increased the energy

($n = 1$) is the lowest of the nucleus ($n = 1$) and the lowest energy ($n = 7$) is the farthest from the nucleus, the most energy and the least connected to the nucleus, which facilitates loss.

Add another quantitative number, which is the secondary quantum number, denoted by ℓ (specify the shape of the orbital) and that ℓ is associated with (n) with the following relation:

$$\ell = (n-1)$$

The main energy levels (K, L, M, N, O, P, Q) have secondary energy levels marked by letters s, p, d, f

These levels differ in terms of shape and number of electrons, since Orbital s has a spherical shape, either p has three orbitals, and each orbital is composed of two equal lobes distributed in the vacuum (Px, Py, Pz)