



SHIKSHA CLASSES

Sub. : Science
Std. : VIIIth - S.B.

Answer Paper
5. Inside the Atom

Marks : 20

Q.1(A) : Choose the correct alternative

2

1) The symbol A is used to denote the _____.

Ans : c) atomic mass number

2) Rutherford alpha-particle scattering experiment was responsible for the discovery of the _____

Ans : a) atomic nucleus

Q.1(B) : Solve any one of the following question

1

1) State the relation between the number of protons, the number of neutrons and the atomic mass number (A) of an element.

Ans : Atomic mass = (A) Number of protons (p) + Number of neutrons (n)

2) The valency of hydrogen is 'one as per the molecular formula H_2O . Therefore valency of 'Fe' turns out to be _____ as per the formula Fe_2O_3 .

Ans : The valency of hydrogen is 'one as per the molecular formula H_2O . Therefore valency of 'Fe' turns out to be 3 as per the formula Fe_2O_3 .

3) Define Atom.

Ans : An atom is defined as the structural and functional unit of a matter.

Q.2(A) : Give reason (Any One)

2

1) All the mass of an atom is concentrated in the nucleus.

Ans : All the mass of an atom is concentrated in the nucleus because atom contains three subatomic particles like electron, proton and neutron. Out of which, nucleus present at the centre of an atom contains two subatomic particles that's protons and neutrons and the mass of nucleus is the sum of mass of protons and neutrons located at the centre of an atom.

2) Atoms are stable though negatively charged electron are revolving within it.

Ans : Atoms are stable though negatively charged electrons are revolving within it because each atom contains equal numbers of protons and electrons. So, charge on negatively charged electrons are balanced by charge on positively charged proton. Therefore, atom is electrically neutral and stable.

Q.2(B): Solve any two of the following question.

4

1) Chlorine contains 17 protons and 18 neutrons. What is its atomic mass number?

Ans : Given

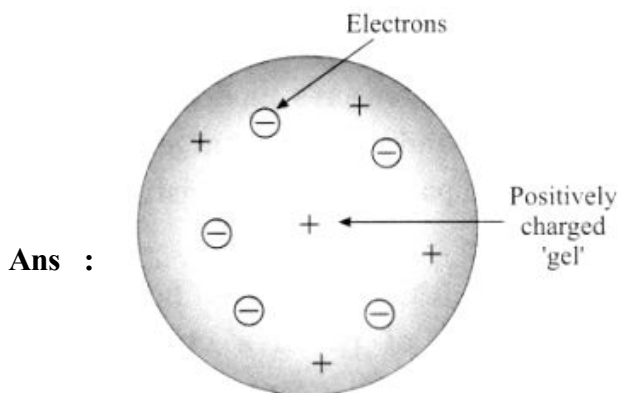
No. of electrons = 17

No. of neutrons = 18

Atomic Mass number = atomic no + no of neutrons

Atomic Mass number = $17 + 18 = 35$

2) Draw a neat labelled diagram of Thomson's atomic model.



3) What were the conclusions drawn from the alpha particle experiment performed by Rutherford?

Ans : On the basis of the alpha particle experiment following conclusions were drawn by Rutherford

1) An atom has tiny, dense positively charged nucleus at center of an atom.

2) Most of the mass of the atom is concentrated in the nucleus.

3) Negatively charged particles called electron revolve around the nucleus.

4) The total negative charge on all the electron is equal to the positive charge on the nucleus. As the opposite charges are balanced the atom is electrically neutral.

5) There is an empty space between the revolving electron and the atomic nucleus.

4) What is meant by subatomic particle? How many types of subatomic particles are found in atom?

Ans : A subatomic particle is a structural and functional unit of the matter. That means all the matters are made up of these fundamental particles. According to modern atomic theory, an atom has a nucleus, which is present in its center or core. These nucleus contain subatomic particles like protons and neutrons. Electrons are subatomic particles in the extra nuclear part.

Q.3 : Solve any two of the following question.

6

1) The symbol used for oxygen is 'O'. There are 8 protons and 8 neutrons in its nucleus. From this determine the atomic number (Z) and mass number (A) of oxygen and arrange these in a conventional symbol.

Ans : Atomic mass number

= Protons + Neutrons

= $8 + 8$

Atomic mass number = 16

Atomic number, i.e. the proton number = 8

The conventional symbol = AO

Z = Atomic number i.e. number of protons is 8

A = Atomic mass number = 16

The conventional symbol = O_8^{16}

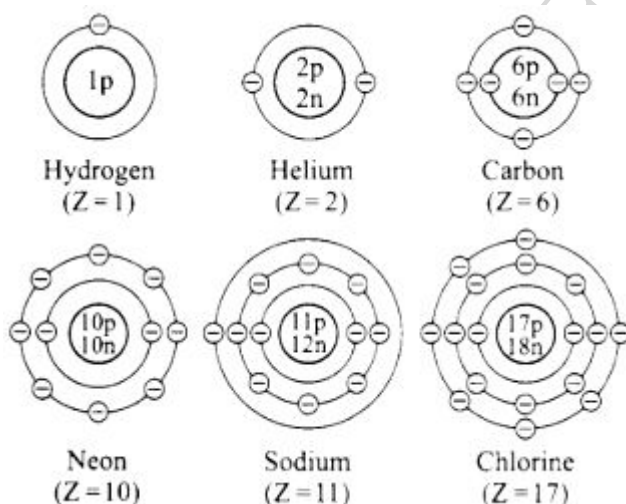
2) What is the maximum number of (electrons that can be accommodated in each of the orbits (shells) K, L, M, N, etc.?)

Ans : The number of maximum electrons in different orbits of the atom are fixed. The orbit (shell) closest to the nucleus is: given the number 1, the next orbit the ; number 2... etc. The orbits one are designated ; by letters K, L, M, N,... corresponding to the shell numbers $n = 1, 2, 3, 4, \dots$ etc. The maximum number of electrons in a given orbit is $2n^2$, when n is the number of orbit (shell), thus the first shell has the capacity of 2 electrons, the second 8, the third 18, the fourth 32 and so on. The electrons in the K shell have minimum energy. The electrons in the subsequent shells possess higher energy.

Shell/Orbit		$2n^2$	Maximum number of electrons in the orbit (shell)
Symbol	Number n		
K	1	2×1^2	2
L	2	2×2^2	8
M	3	2×3^2	18
N	4	2×4^2	32

3) Draw suitable diagrams to show the electronic configuration of the atoms of the following elements: Hydrogen, helium, carbon, neon, sodium, chlorine.

Ans :



4) State the uses of isotopes.

Ans : Isotopes of some elements are radioactive. Isotopes are used in various fields such as industry, agriculture, medicine, research field.

- 1) Isotopes of uranium are used for nuclear fission and production of electricity.
- 2) Cobalt – 60 are used in the treatment of cancer.
- 3) Iodine – 131 is used in the treatment of goitre.

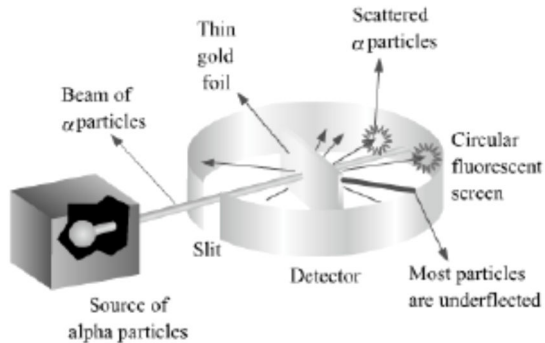
- 4) The radioactive isotopes, Sodium – 24 are used for detection of cracks (leakage) in the underground pipes.
- 5) Radioactive isotopes are used for food preservation from microbes.
- 6) The radioactive C – 14 is used for determining the age of archaeological objects.

Q.4 : Solve any One of the following question.

5

1) Explain Rutherford's scattering experiment.

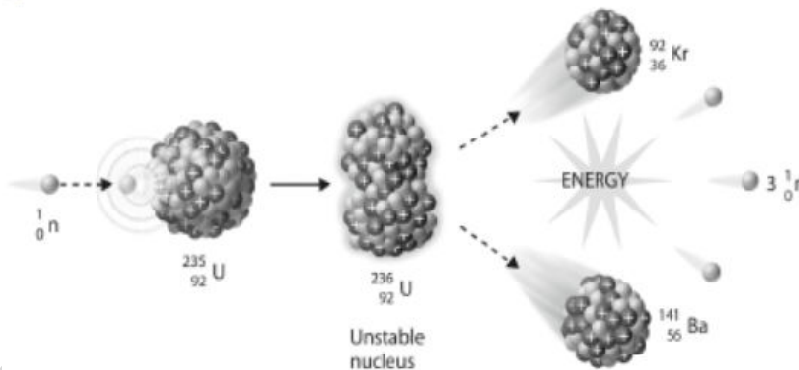
Ans :



Alpha particles emitted by radioactive element bear a positive charge. Rutherford bombarded alpha particles through a very thin gold foil. He observed the path of alpha particles by means of a fluorescent screen around the gold foil. It was expected that Most of the alpha particles passed through the gold foil without any deviation. Some alpha particles were deflected from their path through small angles. A few alpha particles were scattered at large angles. A still smaller number of same sign particles get deflected through a larger angle and one alpha particle out of 20000 bounced back in the direction opposite to the original path.

2) Write a note on Nuclear Reactor.

- Ans :**
- 1) A Machine that generates electricity on large scale by using atomic energy is called a nuclear reactor. In a nuclear reactor ,the nuclear energy in atom is released by bringing about nuclear reaction on the nuclear fuel.
 - 2) When Uranium -235 is bombarded with a slow speed neutron ,it undergoes nuclear fission. various elements are produced. For Example : Krypton-92 and Barium -141 along with 2 to 3 neutrons are emitted on fission, these neutron have high speed. There speed is reduced and they are used for bombarding more Uranium-235 nuclei. The process is repeated many times. In this way chain reaction of nuclear fission takes place .A large amount of nuclear energy is released during a chain reaction of fission. The chain reaction is controlled to prevent the probable explosion.



Neutrons are slowed down using graphite or heavy water as moderator. The chain reaction is controlled by absorbing neutron with the help of rods of boron, cadmium and beryllium. The heat produced in the fission is taken out by water as coolant, Water is converted into steam. The available heat is used to drive turbines to produce electricity

BECOME AN ACE IN JEE & NEET



SHIKSHA CLASSES
Believe & Achieve

JEE | NEET | Previsa (8-10)

📞 8625055707 | 8623085707 🌐 shikshaclasses.co.in

M-19, MHADA Colony, Khat Road, Bhandara



Learn with Jaiswal sir