

Ch-4 Structure of an Atom

1. Sub-atomic particles of atom includes
 - a. Electrons – negatively charged with charge of -1 and negligible mass.
 - b. Protons – Positively charged with charge of $+1$ and mass is 1 u .
 - c. Neutrons – Particles are with no charge and mass of 1 u .
2. **Thomson's model of an atom** – Atom is electrically neutral consisting of positively charged sphere with electrons embedded in it. It failed to explain the results of experiments carried out by other scientists.
3. **Bohr's model of an atom** – An atom has a positively charged nucleus and electrons revolve in permitted circular orbits with fixed radii and energy. Bohr explained the drawback of Rutherford's model of an atom.
4. **Rutherford's model of an atom** – He performed the α -particle scattering experiment and proposed that an atom is electrically neutral, with a positively charged nucleus having protons and neutrons and negatively charged electrons revolving around the nucleus.
5. **Bohr-Bury scheme** – The number of electrons that can be present in a given shell is $2n^2$, when 'n' is the number of shell. Maximum number of electrons in the outermost orbit should not exceed 8.
6. **Valency** – The combining capacity of the atoms of an element is valency. Elements having 1, 2, 3, and 4 electrons in the valence shell, has valency equal to number of electrons. Elements having more than 4 electrons in the valence shell has valency equal to $8 - \text{the number of valence electrons}$.
7. **Atomic number and mass number** – Atomic number (z) is number of protons in one atom of an element. Mass number (A) is the sum of protons and neutrons present in the atom of the element. Notation for an atom - $\overset{\text{Mass number}}{\text{Atomic number}} \text{Symbol of element}$.
8. **Isotopes** – Isotopes are the atoms of the same element, having the same atomic number but different mass number. Isotopes are useful as nuclear fuel, in medical field, in carbon dating, etc.