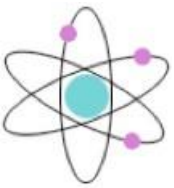
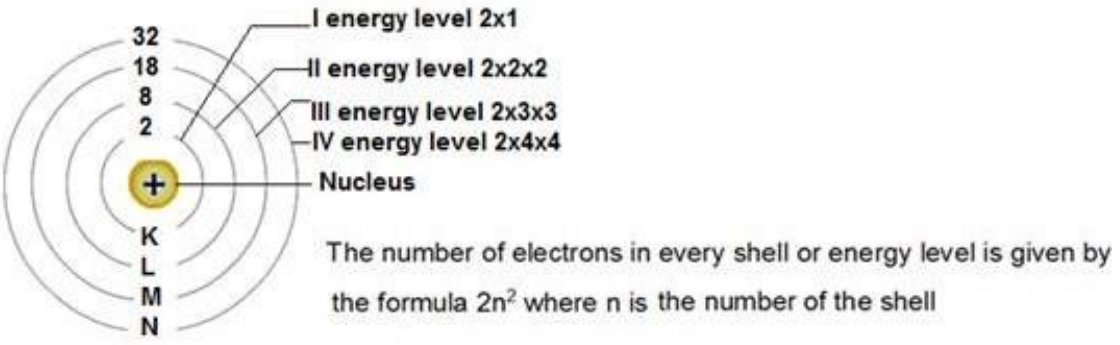
ICSE CHEMISTRY CLASS 8 LESSON 1
STRUCTURE OF ATOM

ATOMIC MODELS

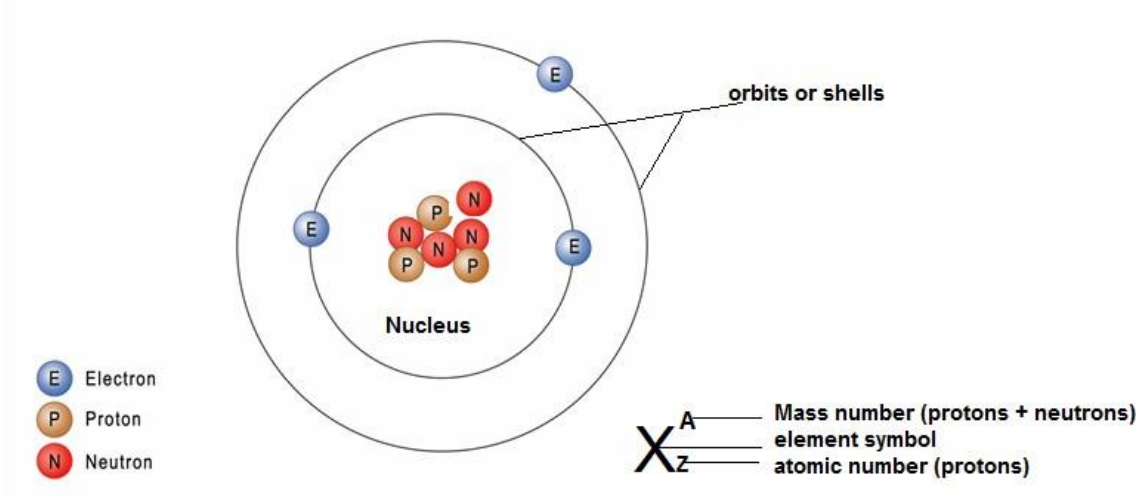
Thomson plum pudding model	Rutherford model	Bohr model
		
Electrons are embedded in a bed of positive spheres Could not explain how atomic mass could be accounted for Could not explain spectral lines	Positively charged particles are located in central nucleus and electrons revolve around this at high speed Much like the solar system Could not explain high stability of atom	Electrons revolve in fixed energy levels or orbits around nucleus that contains protons and neutrons As long as electrons remain in orbits, they do not gain or lose energy

Modern atomic model



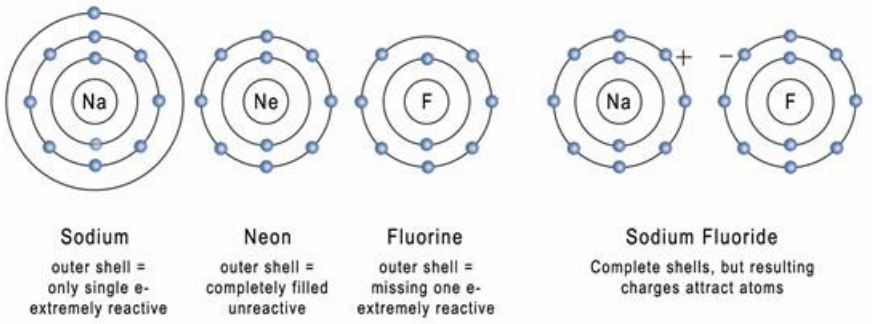
- Valency: The combining capacity of an element. Numerically equal to number of electrons lost, gained or shared by an atom to achieve octet configuration

Structure of the atom and arrangement of particles in atom

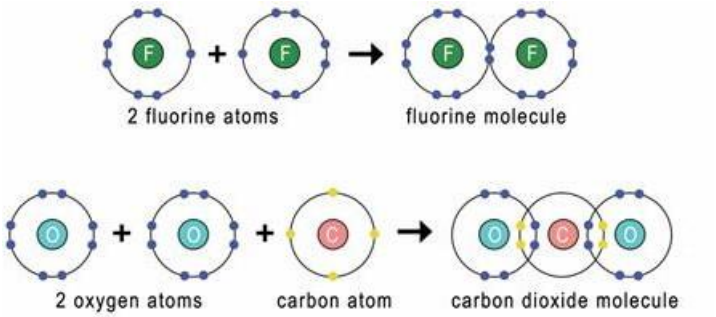


Particle	Charge	Mass	Symbol	Discovered by
Electron	-1	1/1837 of H atom	$_{-1}e^{0}$ or e^{-}	J.J.Thomson
Proton	+1	1.008 amu	$_{+1}p^{1}$	Rutherford, subsequent to discovery of canal rays by Goldstein
Neutron	Neutral	1.008 amu	$_{0}e^{1}$	Chadwick

Ions and ionic bonds

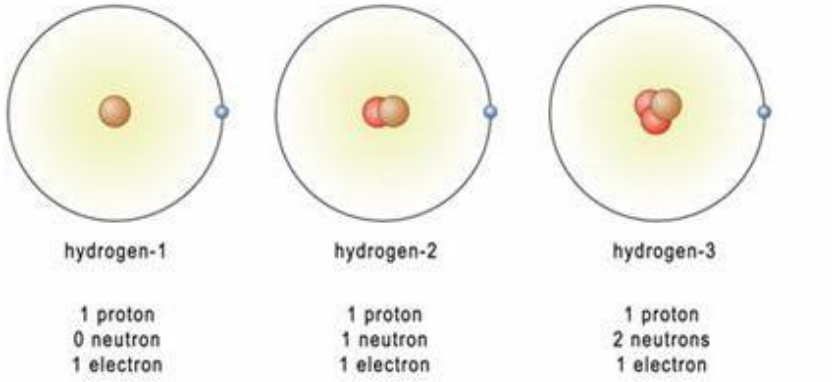


Covalent bonds



Isotopes

Isotopes- (Same atomic number, different atomic mass shown by element)



- Carbon exists as three isotopes- C-12, C-13 and C-14
- Chlorine exists as 2 isotopes C-35 and C-37

Isotopes have same chemical properties but different physical properties

Radioactivity

- The spontaneous emission of highly penetrating rays from nucleus of atoms is called radioactivity
- 3 kinds of radioactive emissions arising due to nuclear fusion or fission
  - Alpha rays: made of positively charged Helium nuclei
  - Beta rays: made of negatively charged particles without mass
  - Gamma rays: electromagnetic radiations with speed of light, no mass or charge

Dalton's atomic theory

- Matter is made of atoms
- Atoms of an element resemble each other but differ from atoms of other elements
- Atoms combine in simple numerical ratios with other atoms of the same or different elements to make molecules
- Atoms are the smallest units that can take part in a chemical reaction