Chemistry

Atomic Structure

Dalton's model 1803

- Atoms are tiny solid balls
- Cannot be broken down into simpler parts
- atoms of same element are identical
- Chemical reaction will be equal to rearrangement of atom

Thomson model 1897

- It is also called plum pudding model
- Thomson do the discovery of electrons
- Atoms are sphere of positive charges
- Negative electrons are embedded in it
- He also propose that overall atom is neutral

Alpha scattering experiment 1907- 1911

- Rutherford Gigar and Mardsen
- Ratherford fired Alpha particles at thin gold foil

Observation

- Most particles pass through it means mostly space is empty in an atom
- Some deflected means particle mass is in centre
- Few bounced back means nucleus is very small,. dense and positive

Ratherford nuclear model 1911

- Atom has a small positively charged nucleus
- Electrons Orbit around the nucleus in a cloud

Bohr model 1913

- Bohar solved the problems of electrons collapse
- Electron Orbit nucleus in fixed energy level shells
- Electrons can move between shells by absorbing or releasing energy and it is called em radiation
- nucleus has protons means positive charge

Chadvick's Discovery 1932

- Chadvick Prove the existence of neutrons that are neutral particles

Current model of atom

- nucleus has protons and neutrons
- electrons has negative charge they are in shells around the nuclear
- nucleus is the most mass of atom but very small as compared to atom
- atoms are neutral if protons is equal to electrons

movement of electron

- if electrons move from lower shell to higher shell it will absorb energy

- if electrons move from higher shell to lower shell it will release energy

Isotopes

- atoms of same element with same protons but different neutrons are called isotopes
- same chemical properties but different masses
- example is carbon 12 and carbon 14

Ionizing radiations

Some unstable nuclei EMIT radiation to become stable

Types are alpha, beta and gamma

Alpha

- Alpha has two protons and two neutrons
- they are heavy
- they have low penetration with high ionization

Beta

- electron emitted when neutron becomes proton
- It has medium penetration and medium ionization

Gamma

- They all are electromagnetic waves
- Gamma radiations have very high penetration and low ionization

Half Life

- time taken for half the nuclei in a radioactive sample to decay
- it is important for dating rocks medical traces and nuclear safety

Irradiation and contamination

- Irradiation means exposure to radiation from outside
- doesn't make the object Radioactive
- example medical sterilization uses gamma rays

Contamination

- radioactive particles enter or land on to the objects
- dangerous because continuously emits radiations until removed or Decay
- example is swallowing or inhaling radioactive dust