Physics

Atomic structure

Dalton's model 1803

- Atoms are tiny solid balls
- They cannot be broken 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
- Discovery of electron
- atoms are sphere of positive charges
- Negative electrons embedded in it
- Overall atom is neutral

Alpha scattering experiment 1907 to 1911

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

Observations

- most particles pass through it means at a mostly has empty space
- some deflected means particles 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's model 1913

- **Bohr solved problem of electrons collapse**
- **Electron Orbit nucleus in fixed energy levels shells**
- **electrons can move between shells by absorbing or releasing energy it is called em radiation**
- **Nucleus has protons means positive charge**

ChadVicks Discovery 1932

Prove the existence of neutrons that are neutral particles

Current model of atom

- **nucleus has protons and neutrons**
- **electrons has negative charge and they are in shells around nuclei**
- **nucleus is the most of mass but very small as compared to atom**

- atoms are neutral if protons is equals to electrons
- Movement of electrons
- if electrons move from lower shell to hire shell it will release
- If electron move from higher level to lower level so electron will absorb 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 nuclear EMIT radiation to become stable

Types are alpha , beta and gamma

Alpha

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

Beta

- **Electron emitted when neutron becomes Proton, medium penetration and medium ionization**

Gamma

- **They are em waves**
- **EM wave means electromagnetic waves**
- **you know Gamma radiations have very high penetration and low ionization**

Nuclear equations

- **They show radioactive decay**
- **Alpha decay has a mass number - 4 and atomic number - 2**
- **Beta Decay has atomic number positive one and electron has also positive one**

Balance both sides for mass number and atomic number

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 inter or land on objects
- dangerous because continuously emits radiation until remove or decay
- Example is swallowing or inhaling radioactive dust

Evolution of atomic model

Dalton then Thomas then ratherford then bohr then chadwick then Modern Quantum model