Chemistry
Lecture
Isotopes

- Isotopes are atoms of same element
- They have same number of protons and same number of electron
- But they have different number of neutron
- example carbon
- carbon has atomic number of 6, it means 6 proton and mass number of 12 means 6 protons and neutrons
- neutrons will be
- N= 12 - 6 = 6

Properties
Physical properties
Properties are like density, boiling point melting point they can change because mass changes

Chemical properties

Chemical properties stay the same because electrons which control chemical reactions don't change
What stays the same in isotopes? Protons
Why do Isotopes have the same chemical property?

Radioactive decay:

1. **Most elements have many isotopes but only one or two are stable**
2. **Unstable isotopes breakdown into other element and release radiation to become stable this process is called radioactive decay**
3. **Sometimes neutrons are also released**

What do we call the process when unstable isotope release radiation to become stable?
Are all isotopes stable ?

Ionising radiation:

Radiation that has enough energy to remove electrons from the atom
This makes the atom positively charged

- Alpha radiation
- Beta radiation
- Gamma radiation

Alpha radiation:

- Alpha radiation helium, has nuclei and it has two protons and two neutrons
- It has very strong ionising power but weak penetration
- Can be stopped by a paper or cloth
- Dangerous is breath in or swallow

Beta Radiation:

1. Flow of electrons or positron
2. It has less ionizing power then Alpha but more penetrating power
3. It can go through the skin and cause burn
4. It can be stopped by a 5mm aluminium sheet and it is used in testing metal thickness

Gamma Radiation:

Electromagnetic radiation like like but with very high energy

are very penetrating they can pass through our body
Only blocked by thick lead
Used in medicine such as cancer treatment

Which radiation can be stopped by paper?
Alpha radaitions

Which radiation can pass through the human body?
Gamma

Which radiation is used in smoke detectors?