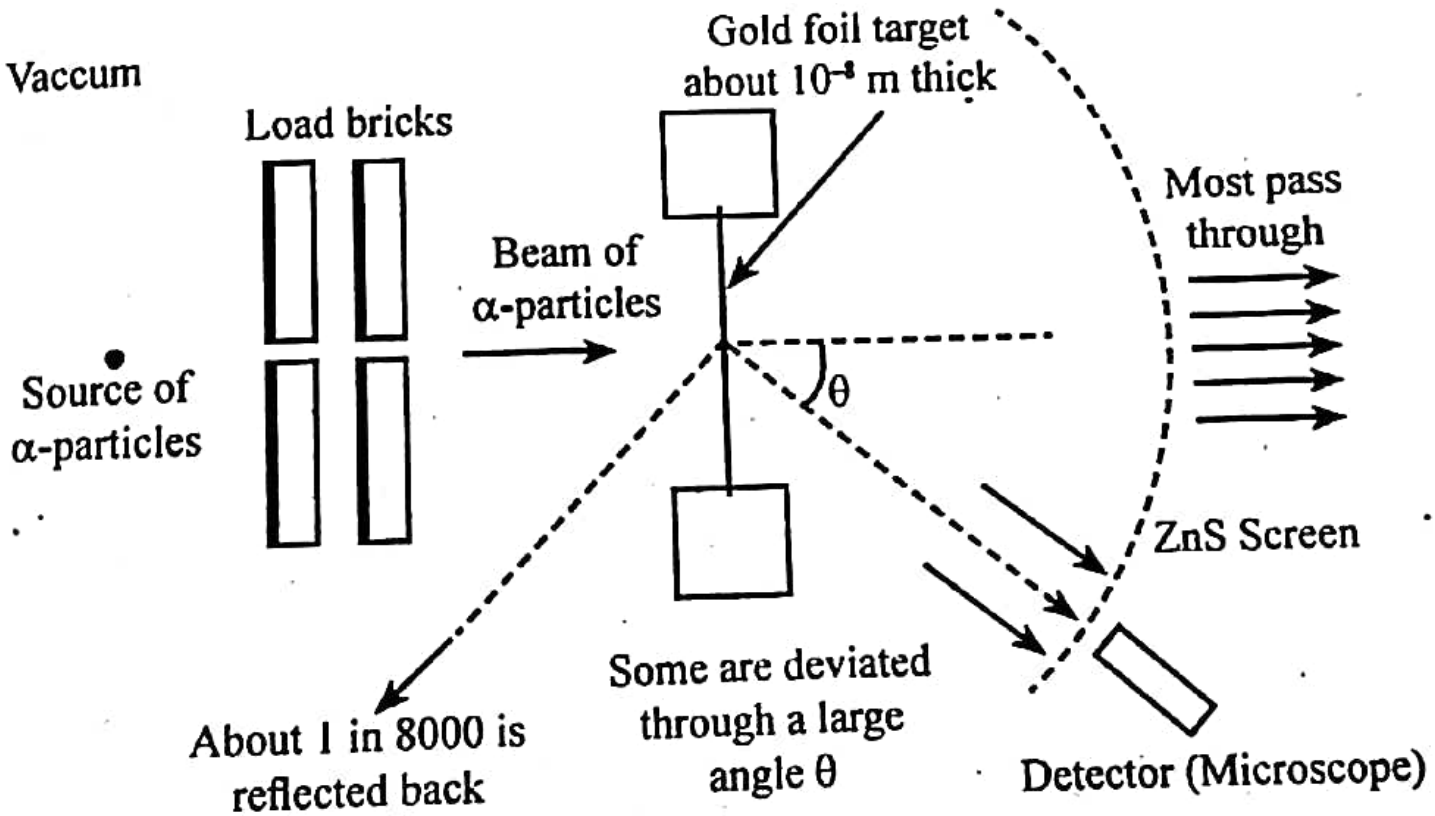
1) Schematic diagram of alpha ray scattering experiment

What are the observations and conclusions made during alpha ray scattering experiment


Vaccum
Load bricks
Gold foil target
about 10^{-6} m thick
Most pass
through
Beam of
α-particles
Source of
α-particles
θ
ZnS Screen
About 1 in 8000 is
reflected back
Some are deviated
through a large
angle θ
Detector (Microscope)

Observations of Rutherford's Alpha Scattering Experiment

The observations made by Rutherford led him to conclude that:

1. A major fraction of the α-particles bombarded towards the gold sheet passed through it without any deflection, and hence **most of the space in an atom is empty**.
2. Some of the α-particles were deflected by the gold sheet by very small angles, and hence the **positive charge** in an atom **is not uniformly distributed**. **The positive charge** in an atom **is concentrated in a very small volume**.

3. Very few of the α-particles were deflected back, that is only a few α-particles had nearly 180o angle of deflection. So the **volume occupied by the positively charged particles in an atom is very small as compared to the total volume of an atom**.

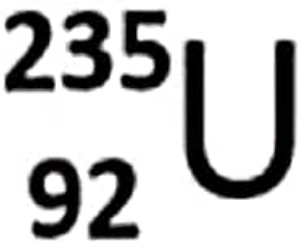
Conclusions :

1. An extremely small positively charged particles are concentrated at the centre of the atom.

2. More number of electrons are revolving around the nucleus of the atom.

3. Most of the space is empty in an atom.

Find the number of protons, electrons and neutrons in the uranium atom represented below



Atomic no. of uranium, $\mathrm{Z} = 92$

$\therefore$ No. of protons $= \mathrm{Z} = 92$

No. of electrons $= \mathrm{Z} = 92$

Also, mass no. $\approx$ at .wt; (Mass no, is integer value)

$\therefore$ Mass no. $\mathrm{A} = 238$

$\because \mathrm{A} = \mathrm{Z} + \mathrm{n}$

$\therefore \mathrm{n} = 238 - 92 = 146$