Brainbox learn easy

Chapter 02

STRUCTURE OF ATOM

Discharge tube of experiment:-

- This experiment is conducted in a long cylindrical glass tube
- Tube is fitted with two metal plates on both ends, which acts as electrodes.
- Tube is partially evacuated to create vaccum.
- At very low pressures (0.01 mm of Hg) and high pressures (10,000V) gases start discharge
- A stream of particles emerge from Cathode and move towards anode. Hence they are named as cathode rays.

ANIMATION REQUIRED

Properties of Cathode rays:-

- They travel in straight lines.
- They deviate in presence of electric or magnetic field indicating that they are negatively charged.
- Their properties are independent of the gas taken in discharge tube.
- For different gases taken the specific charge ratio (e/m) is calculated by J.J.Thomson.

- The e/m value of cathode rays as calculated by J.J.Thomson is - $1.75\times10^{11}\text{C/kg}$
- The constituent particle of cathode rays is named as “electron”.
- Charge on the electron is calculated by R.A.Millikan by “oil drop method” is given as - $1.6\times10^{-19}\text{C}$
- From above two mass of electron is given as

$$\text{m} = \frac{e}{e/m} = 9.1\times10^{-51}\text{kg}$$