Specific Charge of a particle

Ration of charge and mass of particle

Expression for specific charge of electron

$$R = \frac{e}{m}$$

Name of experiment for determination of specific charge of an electron

JJ Thomson's Experiment

Statements of Working Principle of JJ Thomson's experiment of determination of specific charge

Deflection of accelerating beam of electron

List of material Experimental Setup of JJ Thomson's experiment of determination of specific charge

- Glass tube
- Fluoroscent screen

List of electrical setup of JJ Thomson's experiment of determination of specific charge

- Cathode
- Anode
- Helmhotz coil
- Metallic plate

Contents of anode in JJ Thomson's experiment of determination of specific charge

Hole

Role of Helmhotz coil in JJ Thomson's experiment of determination of specific charge

Uniform magentic field

Role of metallic plates in JJ Thomson's experiment of determination of specific charge

Uniform electric field

Role of terminals as cathode and anode in JJ Thomson's experiment of determination of specific charge

High potential

Expression for relation of kinetic energy and potential difference in JJ Thomson's experiment of determination of specific charge

$$eV = \frac{1}{2}mv^2$$

Expression for electric field intensity in terms of potential in JJ Thomson's experiment of determination of specific charge

$$E = \frac{V_1}{d}$$

Condition to be satisfied in JJ Thomson's experiment of determination of specific charge

Equaltiy of force on electron by electric field and magnetic field

Derivation for expression of calculation of charge to mass ratio of JJ Thomson's experiment of determination of specific charge

- $$eV = \frac{1}{2}mv^2$$
- $$\frac{e}{m} = \frac{v^2}{2V}$$

- $$Bev = eE$$
- $$v = \frac{E}{B}$$
- $$\frac{e}{m} = \frac{E^2}{2B^2V}$$
- $$\frac{e}{m} = \frac{V_1^2}{2Vd^2B^2}$$

Expression for calculation of charge to mass ration of JJ Thomson's experiment of determination of specific charge

- $$\frac{e}{m} = \frac{V_1^2}{2Vd^2B^2}$$

Magnitude of Value of specific charge JJ Thomson's experiment of determination of specific charge

$$\frac{e}{m} = 1.76 \times 10^{11} C/kg$$