DATE:

where 'e' is the charge on electron and Ee is the upward driving force on the droplet due to applied electrical field of strength E.

Dividing equation (1) by (2)

$$\frac{v_1}{v_2} = \frac{mg}{Ee - mg}$$

The values of v_1 and v_2 are recorded with the help of microscope.

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Long Question

Introduction

In 1909, Millikan determined the charge on electron by a simple arrangement.

Composition

The apparatus consist of a metallic chamber. It has two parts. The chamber is filled with air, the pressure of which can be adjusted by a vaccum pump. There are two electrodes A and A'.

Experiment

A fine spray of oil droplets is created by an atomizer. A few droplets passes through the hole in the top plate and into a region between the charged plates, where one of them is observed through a microscope. This droplet, when illuminated prependicularly to the direction of view, appears in the microscope as bright speck against a dark background. The velocity of the droplet (V_1) depends upon its weight, mg.

$$V_1 \propto mg$$

Explanation

The velocity of the droplet (V_1) depends upon its weight, mg.

$$V_1 \propto mg$$

where "m" is the mass of the droplet and "g" is the acceleration due to gravity. After that the air between the electrodes is ionized by X-rays. Now, connect A and A' to a battery which generates an electric field having a strength E. The droplet moves upwards against the action of gravity with a velocity (V_2)

$$V_2 \propto Ee - mg$$

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gas are basically protons & cathode ray are fast moving electron. As protons are 1836 times heavier than electrons therefore the e/m value of hydrogen gas positive ray is 1836 times smaller than that of cathode rays.

(ii)

Necessary to decrease pressure

At high temprature greater number of molecules creates hindrance in way of elections (cathode rays) pass through them. Therefore, it is necessary to decrease the pressure in discharge tube to get cathode rays.

DATE:_____

MCQ's

i) C
ii) A
iii) A
iv) C
v) A

Question No. 2
Short Questions

(iii)

diff b/w frequency & wave number

Frequency	Wave number
The frequency is the number of waves that pass a given point in one second.	A wave number refers to the spa frequency of a wave over a specific unit distance.
Unit	**Unit**
The frequency unit is measured in hertz.	Wave numbers are usually measured in units of reciprocal meters.
Formula	**Formula**
$V = C/\lambda$	$\bar{v} = 1/\lambda$

(i)

Justification

Positive rays produced by hydrogen