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Lab # 1

**Millikan Oil – Drop**

1. **Objective:**

To show an electric charge dropped in oil is quantized.

1. **Data/ Results:**

Let’s is a density of oil,

d is the diameter, (m)

M is a mass of oil (Kg)

q is a charge q of the drop

is a ratio between the charge q compare with charge electron.

∆Vs is Voltage drop

g is acceleration due to Gravity

D is Distance between the plates (m)

The density of oil is = 856 kg/, g= 9.8, e= 1.6 C

To calculate the diameter, mass, q and of trial # 1

Example trial # 1:

r =1.29\*m

d = 310 mm = 3.10 m

∆V= 242V

M= = \* \* 856 = 7.75\* kg

=mg (1) and =|q|E (2)

Mg = |q|E => |q|=

E=

=>|q|= (7.75\*)\* 9.8 \* / 343 = 9.4\* C

= 5.875

1. **Conclusion:**

The problems that are tracking the drops for extended period and velocity of time. The droplets would disappear and would come out not charged. This didn’t affect the final result just made the experiment more annoying. Overall, I think that most of the most of the error involved in experiment was random error. I had no control over the charge on the oil droplets**.**

Result table trial # 1 to 8:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Trial #** | **Radius**  **r (m)** | **∆V (V)** | **Mass (kg)**  **M=** | **|= ©** |  |
| **1** | 1.29\* | 242 | 7.7\* | 9.4\* | 5.875 |
| **2** | 1.39\* | 361 | 9.62\* | 7.8\* | 4.875 |
| **3** | 1.20\* | 169 | 6.19\* | 10.7\* | 6.6875 |
| **4** | 1.33\* | 197 | 8.43\* | 12.5\* | 7.8125 |
| **5** | 1.40\* | 233 | 9.83\* | 12.4\* | 7.75 |
| **6** | 1.43\* | 245 | 1.04\* | 12.5\* | 7.8125 |