UA-03 MILLIKAN'S OIL DROP EXPERIMENT AND ELEMENTARY CHARGE

- The elementary (smallest possible) charge
- Force of gravity
- Electrical field between two plates
- Electron charge
- Viscosity
- Quantization of electric charge

Millikan unit type A

The emphasis of the experiment; is to make an accurate measurement of the electron charge .

The success of the Millikan Oil-Drop experiment depends on the ability to measure small forces. The behaviour of small charged droplets of oil, weighing only 10^{-12} gram or less, is observed in a gravitational and electric field.


Millikan unit type B

The experiment entailed balancing the downward gravitational force with the upward buoyant and electric forces on tiny charged droplets of oil suspended between two metal electrodes. Since the density of the oil was known, the droplets' masses, and therefore their gravitational and buoyant forces, could be determined from their observed radii. Using a known electric field, Millikan and Fletcher could determine the charge on oil droplets in mechanical equilibrium. By repeating the experiment for many droplets, they confirmed that the charges were all multiples of some fundamental

By selecting droplets which rise and fall slowly, one can be certain that the drop has a fairly small charge. A number of such drops should be observed and their respective charges **q** calculated. If the charges **q** on these drops are integral multiples of a certain smallest charge **e**, then this is an observation that charge is quantized.


Millikan power supply

Measuring the velocity of fall of the drop in air enables, with the use of Stokes' Law, the calculation of the mass of the drop. The observation of the velocity of the drop rising in an electric field then permits a calculation of the force on, and hence the charge, carried by the oil drop.

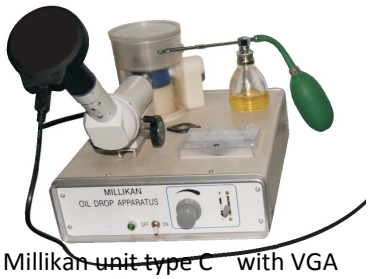
UA-03 Millikan's oil drop and elementary charge experiment consists of:

- Millikan apparatus ,
- Atomizer
- Volt meter,
- Power supply
- Microscope
- All connecting cords and items necessary to carry on the experiment
- Option :
- CCTV system can use in observation instead of the eye . The experiment will be better accurate due to better visibility .

Millikan unit type C

OPTION:

CCTV SYSTEM , AVOID DIRECTLY VIEW , MORE SAFE FOR EYES, OUTPUT CAN BE FOR ALL STUDENTS , OR ONE CAN CARRY IT , AND TAKES THE RESULTS ON SD RAM (OPTION). THE SYSTEM OUT PUT CAN BE ANALOGE , VGA OR HDMI AND THE OUTPUT ON SCREEN OR PROJECTOR.



Millikan unit type C with VGA Camera

UK-SCIENTIFIC LTD. UK, Unit 24 , Chatterley Whitfield Enterprise Centre, Off Biddulph road, Chatterley Whitfield, ST6 8UW, Stoke on Trent, UK. www.uk-scientific.com . info@uk-scientific.com