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ELECTROSTATIC KIT

CAT NO. PH0900

Instruction Manual

DESCRIPTION:

This kit is ideal for small group experiments in electrostatics. The set is built around the special dual-purpose electroscope which, while being very suitable for general work, also enables comparative measurements to be made on the activity of weak radio-active materials.

The electroscope has an enameled metal case mounted on a moulded bakelite base. Easily removable glass panels are provided at the front and back, one clear and one ground, the ground glass acting as a matt white background for the gold leaf, or as a screen on which to project a shadow of the leaf for demonstration purpose. A removable insulating bush is fitted into the top of case, which supports the plated metal blade to which the gold leaf may be attached, and a 4 mm socket earthing terminal is fitted at the side of the case.

Two interchangeable electrodes are supplied, the one being a traditional 50 mm disc on a peg and the other being an elongated hook, 160mm long, which may be removed after charging, by using an insulating rod, thus isolating the gold leaf mount, reducing its capacity and increasing the sensitivity of the electroscope for radioactivity experiments.

THE KIT COMPRISE:

- 1 Electroscope as described with top plate and hook electrode.
- 1 Packet of gold leaves.
- 4 Metallised polystyrene spheres.
- 1 Reel of very fine nylon thread.
- 2 Polythene plate 75mm square.
- 1 Electrophorus plate 50 mm diameter with an insulating handle.
- 1 Proof plane, a 13mm diameter metal disc on an insulating handle.
- 2 Aluminium calorimeters 50 mm x 25 mm diameter.

- 1 Cellulose acetate strip.
- 1 Polythene strip 150x25mm.
- 1 Woollen rubber for above.
- 1 Stirrup for suspending strips.

ABOUT ELECTROSCOPE:

The electroscope consist of a small disc mounted on a conducting rod. At the lower end of the rod a thin strip of gold leaf is attached. The leaf is glued in place at one end so that the other end is free to move. If, for example, a positively charged object is brought near to the metal cap, electrons will be drawn up the rod to the cap by the attraction of the positive charges. This will make the other end of the rod and the metal leaf positively charged. As both leaf and rod have the same charge, the leaf will be repelled from the rod and will curve away from it. The angle between the rod and the leaf is a rough measure of the charge on the object.

Using the top plate, all the usual basic experiments may be performed.

Using the hook electrode in place of the plate, the electroscope may be charged by merely lifting the hook from the instrument by means of a charged insulating rod. A polythene or acetate strip is very convenient when rubbed with a woollen cloth. Thus the leaf may be charged repeatedly to the same potential so long as the charge on the rod is reasonably constant. When the hook is removed, the capacitance of the electroscope is reduced and so is any tendency to leak from the top electrode. The electroscope may be used in this way as a simple ionisation chamber electrometer which is very useful for comparing weak radio-active materials which may be placed on a watch glass or supported on a cork inside the case.

EXPERIMENTAL NOTE:

The metallised polystyrene spheres may be suspended on fine nylon threads to serve as light 'hollow' conductors which can be charged by 'wiping' using the edge of charged strips, or by induction, holding the strip near and earthing the sphere.

Repulsion and attraction of like and unlike charges may be shown by suspending two spheres close to each other, or by suspending a charged strip in the wire stirrup provided.

The polythene and cellulose acetate strips used with the ‘rubber’ provided, produce opposite charges.

The 50mm diameter disc on the insulating handle may be used as a condenser plate or as an Electrophorus disc in conjunction with the square polythene plates.

A small proof plane as provided in the kit is particularly useful for investigating the distribution of charge on conductors.

By removing the hook from the electroscope after charging, using an insulating rod, the electroscope may be used as a sensitive low-capacity indicator in radio-activity work.

Radio-active specimens (Not supplied) may be inserted into the case beneath the gold leaf and the time taken to discharge the leaf between two arbitrary points noted for different materials.

Manufactured by :
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