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DEMONSTRATION ELECTROSCOPE

CAT NO. PH0917A



Experiment Guide

INTRODUCTION

The primary purpose of the apparatus is to detect the presence of and measure the magnitude of a static electric charge. A charge is either induced or conducted through the metal plate on the top of the device. The needle mounts to the central rod, and deflects due to the charge on the metal plate.

As charges are collected on the apparatus, the lever arm, which is adjacent to the stationary arm, rotates due to the repulsion of like charges. This process will not determine the type of charge, only that a charge does exist. The greater the charge, the farther the lever arm will move.

TO CREATE A NEGATIVELY CHARGED ELECTROSCOPE

A negative charge can be easily created by rubbing a balloon on your hair. Placing the balloon on the large zinc plate will transfer the charge, leaving the electroscope negatively charged.

TO CREATE A POSITIVELY-CHARGED ELECTROSCOPE

1. Using one hand, rub an inflated balloon on your hair.
2. Place one finger on the top of the electroscope.
3. With your finger still on the electroscope, bring the charged balloon near the zinc plate.
4. Remove your finger from the top of the electroscope and then move the balloon away from the zinc plate.

Over time, the charge on the electroscope will dissipate, especially on humid days. Ions in the air cause the excess charges to be "lost" and the charge on the electroscope will eventually become neutral.

TROUBLESHOOTING

Sometimes the weather conditions are not optimal. If you are having a difficult time getting charges on objects, here are some tips to try.

1. Plan to do static electricity experiments on a day with very low humidity. About 70% humidity or less is ideal.
2. Dry the air around the apparatus with a hot hair dryer before conducting experiments.
3. Make sure no apparatus is wet when in use.
4. Someone with sweaty palms will not be able to get a good charge on a charging rod. Use talcum powder to dry off hands and reduce moisture.
5. Clean all metal conductors with rubbing alcohol at least once a year. Apply a small amount of rubbing alcohol to a clean dry cloth and then rub the metal surfaces so they are moist but not damp. Let the rubbing alcohol evaporate off before using the apparatus. Oil from students hands can build up on the metal causing an insulating layer and making charge difficult to transfer.
6. Charge can easily be removed by objects that are near to it. make sure that no other objects (hands, hair, books, etc.) are near the apparatus when is use. Once charge is on an object make sure your hand touches no metal parts of the apparatus. Use insulating wands to prevent charge from being accidentally transferred.

Manufactured by :



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