Using an Electroscope Lab #19

Pre-Lab Discussion

Fur will leave rubber with a negative charge. Using this information, we will charge an electroscope with positive and negative charges and then test objects with an unknown charge.

Research Question

How can an electroscope be used to test whether an unknown charge is positive or negative?

Materials

leaf electroscope	fur	rubber rod
silk	glass	unknown rods

Method

1. Charge an electroscope by conduction (contact) with a negatively charged balloon. Show the charging on the testing sheet (Part I).
2. Test the charge on a Lucite rod (clear) when rubbed with silk. (*Do not make contact with the electroscope*.) Show the testing on the testing sheet (Part I).
3. Test the charge on a Cenco plastic rod (black) when rubbed with fur (purple felt). (*Do not make contact with the electroscope*.) Show the testing on the testing sheet (Part I).
4. Charge an electroscope by induction (no contact) with a negatively charged balloon. Show the charging on the testing sheet (Part II).
5. Test the charge on a Lucite rod (clear) when rubbed with silk. (*Do not make contact with the electroscope*.) Show the testing on the testing sheet (Part II).
6. Test the charge on a Cenco plastic rod (black) when rubbed with fur. (*Do not make contact with the electroscope*.) Show the testing on the testing sheet (Part II).

Data Collection and Processing

Use the supplied testing sheet (Parts I and II) to show your observations.

Conclusion

1. Explain how to charge an electroscope using the grounding technique. Is this method by conduction or induction?

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2. What is the difference between charging by induction and charging by conduction?

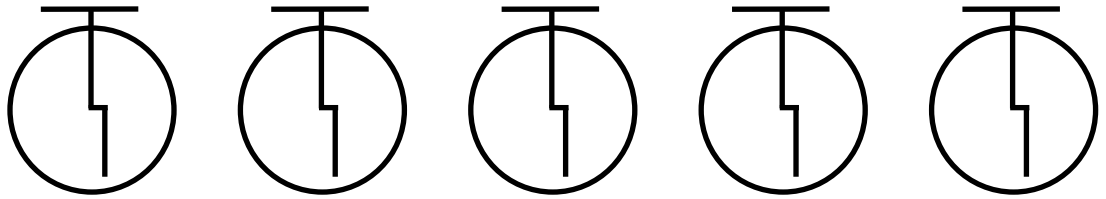
3. Explain how to give an electroscope a negative charge using the grounding technique.

4. Explain how to give an electroscope a negative charge using induction.

5. Explain how to give an electroscope a negative charge using conduction.

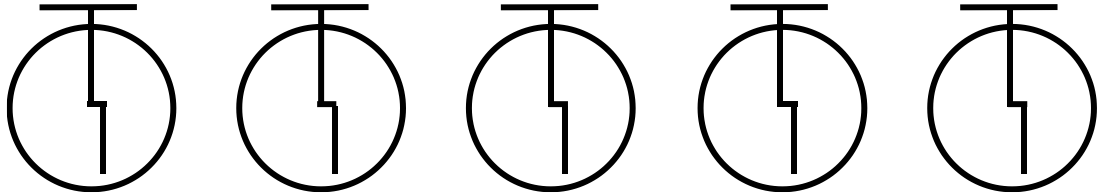
Part I: Testing two unknown charges with a negatively charged electroscope.
Use only as many of the outline drawings as necessary to show your observations.

1. Show the charging of the electroscope by contact from a negatively charged balloon.



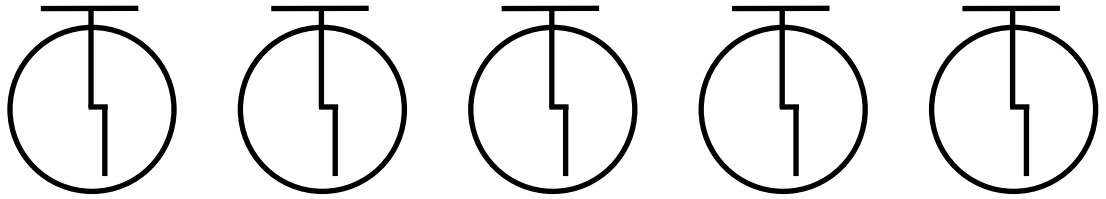
neutral electroscope

2. Show the testing of the charge on the Lucite rod rubbed with silk. *Do not make contact with the electroscope*.



negative electroscope

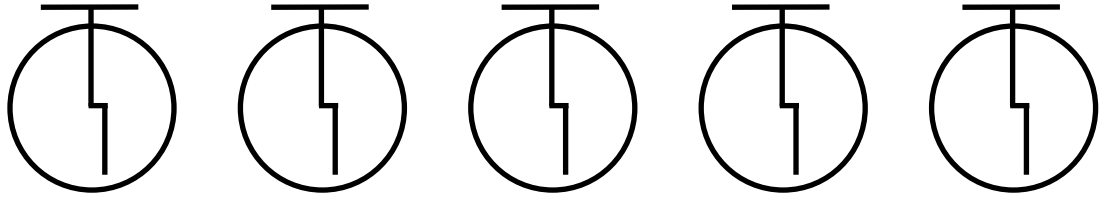
3. Show the testing of the charge on the Cenco plastic rubbed with fur. *Do not make contact with the electroscope*.



negative electroscope

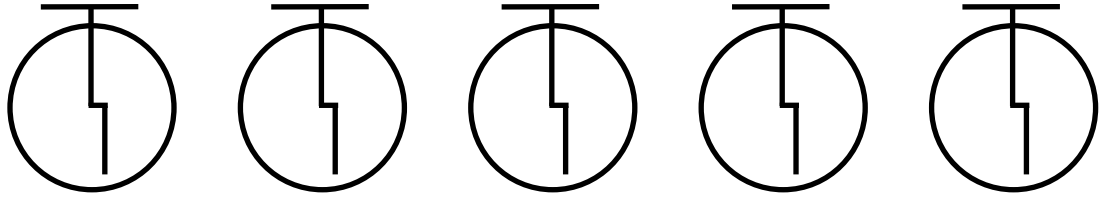
Part II: Testing two unknown charges with a positively charged electroscope.
Use only as many of the outline drawings as necessary to show your observations.

4. Show the charging of the electroscope by induction from a negatively charged balloon.



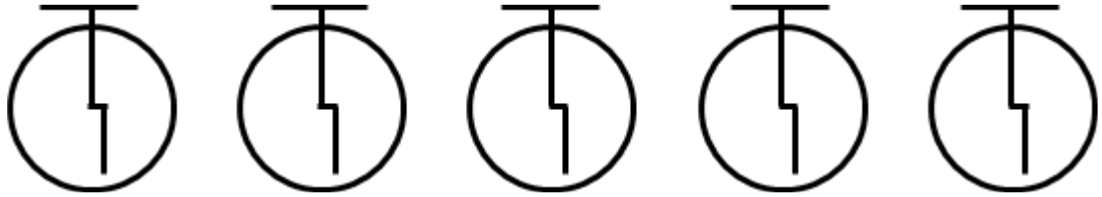
neutral electroscope

5. Show the testing of the charge on the Lucite rod rubbed with silk. *Do not make contact with the electroscope*.



positive electroscope

6. Show the testing of the charge on the Cenco plastic rubbed with fur. *Do not make contact with the electroscope*.



positive electroscope