GETTING A CHARGE -- QUICKIE LAB

Purpose: To verify the effects of like and unlike electrostatic charges upon each other and to understand the difference between conduction and induction.

Groups of 2; group lab report on parts 1-5 only; worth 15 points

Warning: Electroscope leaves are very fragile, handle with care.

Given: A hard rubber rod rubbed with fur produces an excess negative charge on the rod.

Procedure (address each of the following):

1. Operate the electrostatic generator (plate machine) and observe what happens. Briefly explain how it operates. Does it use induction, conduction, or both? What charge (+ or -) is on the tinsel?

2. Charge the different types of rods and bring them close to the electroscope or pithballs:
   a. Observe what happens when charged objects are brought into close proximity to either device and then removed (induction), as compared to when they actually touch (conduction). Briefly describe your observations and draw sketches (showing charges) of two different experiments.
   b. Once charged, how can the devices be neutralized without being grounded?

3. Use a charged PVC tube to get the neon light to glow. Why does it glow? Do you actually need to make contact? Explain.

4. Inflate a balloon and experiment with it uncharged and charged. Does it pick up or repel the peanuts? Is it attracted or repelled by a charged PVC tube? What type of charge do the balloon, tube, and peanuts carry? Briefly describe your observations and draw sketches (showing charges) of two different experiments with the balloon.

5. Charge the PVC tube with whatever material seems to give the greatest charge. Try picking up some styrofoam peanuts, or try pouring some peanuts over the tube:
   a. Explain the behavior of the peanuts when close to the charged tube. Where is the charge most concentrated on the tube? What type of charge is it?
   b. Try floating the plastic loop with the tube. Draw a diagram showing charges. How high above the tube (cm) does the ring float?