

Homework Assignment #3 due Friday, February 2 in class.

Set up an electroscope using ordinary clear tape and test the electrostatic properties of several items with it.

- Take a 2 or 3-inch strip of tape and fold down one of the ends so you can hold the tape without it sticking to your fingers. Do this again so you have two pieces. Label the handle of one piece with a “T” and the other with a “U”.
- Stick the tacky side of tape *T* to the smooth, untacky side of tape *U*. Be sure they are stuck together, and then pull them quickly apart.

A. What do you observe when you bring the two pieces of tape close together? What does this mean about the charge state of the two pieces? Make another set of charged tapes *T* and *U*. How do the two *T* (or the two *U*) tapes react to each other?

- You’ve just built a mini-electroscope. Now you can use it to investigate other objects. Stick your two pieces of tape near each other on something (like the edge of a table, bottom of a lampshade, etc). Now try rubbing everyday items (toothbrush handle, glass, comb, various containers) with different fabrics (cotton, silk, wool, fur, synthetic fiber, plastic bags), and see how the electroscope leaves react.

B. Try this for at least 4 different objects and 4 different fabrics for a total of at least 10 different fabric-object combinations. Describe your observations. Make a table sorting your results into different categories, such as “Charge Type *T*”, “Charge Type *U*”, and “no observed charge”. Look at your results and draw any conclusions you can.

- By our normal definition of positive and negative charge, a comb becomes negatively charged when you use it to comb your hair.

C. Is tape T or tape U negatively charged? Explain.