Term 3 Week 5

Electrostatics Extras Experiment 14.2 Background Notes and Questions

- Human Hands (if very dry)
- Leather
- Rabbit Fur
- Glass
- Human Hair
- Nylon
- Wool
- Fur
- Lead
- Silk
- Aluminum
- Paper
- Cotton
- Steel (neutral)
- Wood
- Amber

More likely to lose electrons, becomes more +

- Hard Rubber
- Nickel, Copper
- Brass, Silver
- Gold, Platinum
- Polyester
- Styrene (Styrofoam)
- Saran Wrap
- Polyurethane
- Polyethylene (scotch tape)
- Polypropylene Vinyl (PVC)
- Silicon
- Teflon

More likely to steal electrons, becomes more -

In general when two objects listed in the chart are rubbed together, the material listed higher in the chart becomes positively charged and the material listed lower in the chart becomes negatively charged (e.g., when rabbit fur is rubbed on glass, the fur will be positively charged, the glass negatively). The greater the separation of the materials in the chart, the greater the magnitude of the charge transferred.

Material	Relative charging with rubbing
rabbit fur	+ + + + + +
glass	+ + + + +
human hair	+ + + +
nylon/wool	+ + +
silk	+ +
paper	+
cotton	–
wood	– –
amber	– – –
rubber	– – – –
PVC	– – – – –
Teflon	– – – – – –

Triboelectric Series

- If we did a study of many materials and put them in order from those with the least desire for electrons to those with a very strong desire for electrons we would have created a Triboelectric series.
- If two items from the list are rubbed together, then the item that is higher on the list will end up more positive and the lower one will end up more negatively charged.
- Eg. if leather were rubbed with wool, the leather becomes positive and the wool negative.
- Eg. rubber is rubbed with wool, the rubber becomes negative and the wool positive.
- Nb. this series is true only if the samples are clean and dry. The presence of moisture, dirt, or oils may cause some of the items to interact differently.