

# Lab 5 assignment

[Science](#), [Physics](#)



This experiment is meant to perform an investigation on the amount of static electricity available in various objects. The experiment was done on an inflated balloon, wool sweater, a sheet of tissue paper, an empty 12-oz soda can, a full 12-oz soda can and a hard surface.

### Hypothesis

The woolen sweater will have the highest amount of static electricity.

### Background

Static electricity is created when electric charges accumulate on a surface of a body. These charges remain on the surface of the body until they are discharged by being in contact with the surface of another body. All objects have atoms which contain atoms, neutrons and protons. The position of an object on the triboelectric series is used to determine the ability of an object to hold or release its electrons.

Static charges can be created by rubbing two insulating materials together. The friction that occurs between the two materials generates static electricity.

### Materials

- a) An inflated balloon
- b) A wool sweater, scarf, or other piece of cloth. A piece of nylon stocking will also work well.
- c) A sheet of tissue paper
- d) Scissors
- e) An empty 12-oz soda can
- f) A full 12-oz soda can
- g) A hard surface, such as a tile kitchen floor

## Procedure

1. Use the scissors to cut the tissue paper into small pieces, each piece about  $\frac{1}{4}$  inches square in size.
2. Place the tissue paper pieces in a pile on top of a table.
3. Rub the inflated balloon over the cloth or over your hair for a few seconds to let an electric charge develop on the balloon.
4. Immediately move the balloon toward the pieces of tissue paper. Bring it close to the pieces without actually touching them. Record what happens to the tissue paper pieces as the balloon is brought close to them.
5. Now, lay the empty soda can horizontally on a hard floor. Rub the balloon again to charge it. Bring the balloon close to the soda can and observe what happens. Record your observation.
6. Finally, do the same thing as in step five but this time use the full soda can.
7. Record your observations.

## Observations and analysis

After the test had been done, the numbers of tissue pieces collected were recorded in the table below:

Item

No. of the tissues attracted

Woolen sweater

21

Empty soda

5

Full soda

2

Floor

0

The woolen sweater collected the highest number of tissue papers as compared to all the other items while the hardened floor collected the least number of tissue pieces.

Conclusion

It was noted that after the balloon was rubbed on the hair, it became charged and after being brought close to the tissue paper, they were attracted to it and collected a large number of tissue papers which had an opposite charge. This can be attributed to the fact that on rubbing the balloon against the woolen sweater, the balloon becomes charged with a charge opposite to that in the tissues.

The hypothesis that the woolen sweater has the highest static charge is proven to be true.

References

Hobart Mason, 1904, A text-book on static electricity, McGraw publishing company. pg. 78-81.

Robert William Hutchinson, 1917, Advanced Text-book of Magnetism & Electricity, W. B. Clive publishers. Pg. 154-159.