Science 9/10 H Static Electricity

**Objective:**

In this lab students will separate charge using adhesive tape. They will use the triboelectric series to determine which piece of tape is has a positive charge and which piece of tape has a negative charge. Students will also investigate the interaction between charged objects.

**Equipment:**

Adhesive tape

Triboelectric series

Ring stand and ring clamp

Two materials from the triboelectric series

**Procedure:**

1. Attach the ring clamp to the ring stand.
2. Tear off a piece of tape, about 10 cm in length. Fold one end of the tape to make a handle that is not sticky. Stick the piece of tape to your desk. Write “B” on the handle of the tape.
3. Tear off a second piece of tape, about 10 cm in length. Fold one end of the tape to make a handle that is not sticky. Stick the piece of tape **on top of the first**. Write “T” on the handle of the tape.
4. Pull the pair of tapes off the desk and then separate the B and T pieces by quickly pulling them apart. Attach them to the ring clamp separately.
5. Bring your finger towards each of the suspended pieces of tape. Describe what happens (attract or repel):

|  |  |  |
| --- | --- | --- |
| **Object** | **Tape** | **Observation** |
| Finger | T |  |
| Finger | B |  |

1. Repeat steps 1 and 2 twice (so that you have two sets of tape).
2. Pull one of the pair of tapes off the desk and then separate the B and T pieces by quickly pulling them apart. Attach them to the ring clamp separately.
3. Pull the second pair of tapes off the desk and then separate the B and T pieces by quickly pulling them apart. One at a time, bring these pieces of tape near the suspended pieces. Describe the interaction between the following pairs of tape when they are brought near one another (attract or repel):

|  |  |
| --- | --- |
| **Tape Combination** | **Observation** |
| Two T tapes |  |
| Two B tapes |  |
| One T and one B tape |  |

1. Choose a rag and a rod-like object (record which materials you have chosen). Consult the triboelectric series to determine the charge that the rod will have after it is rubbed with the rag (p. 276 in your textbook). Try to choose materials from opposite ends of the series. Record the charge on the rod in the table.
2. Repeat steps 1 – 3.
3. Rub the rod vigorously with the rag and then bring the charged rod near the suspended T and B tapes. Describe the behaviour of each piece of tape (attract or repel):

Rod = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Rag = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Charge on Rod** | **Tape** | **Observation** |
|  | T |  |
| B |  |

**Questions: Use complete sentences and thoroughly explain your answers.**

1. How many different types of charge do there appear to be?
2. How do two objects that are positively charged interact?
3. Which tape, T or B, has a positive charge? How did you know?