

Experiment 1.1

Atoms and Molecules

Objective: The objective of this experiment is to learn about the difference between atoms and molecules.

Hypothesis: **If** we submerge two copper wires connected to the terminal ends of a 9-volt battery into a solution of baking soda and water, then the electricity flowing from the battery will break down the **molecules** in the water so that we see bubbles of hydrogen and oxygen.

Materials:

- A small clear glass
- Baking soda
- A 9-volt battery
- Two 9-inch pieces of insulated wire. The wire itself must be copper.
- Scissors
- Some tape
- A spoon for stirring
- Eye protection

Procedure:

1. Fill your small glass 3/4 full of tap water.
2. Add a teaspoon of baking soda and stir vigorously.
3. Use your scissors to strip about a quarter inch of insulation off both ends of each wire. Be careful.
4. Once you have stripped the insulation off both ends of each wire, connect the end of one wire to one of the two terminals on the battery. Do this by laying the wire over the terminal and then pressing it down. Secure it to the terminal with a piece of tape.
5. Repeat step four with the other wire and the other battery terminal. **Do not allow the bare ends of these wires to touch each other!**
6. Immerse the wires in the baking soda/water solution that is in the small glass so that the bare end of each wire is completely submerged.
7. Look at the bare ends of the wires as they are submerged in the baking soda/water solution. What do you see? **Make notes.**
8. Once you get things working, spend some time observing what's going on. Notice that

bubbles are forming on both wires. **Make notes.**

9. Allow the experiment to run for about 10 minutes. After that time, pull the wires out of the solution and look at the bare ends. What do you see? **Make notes.**

10. If you let the experiment run for 10 minutes, it is very possible that your solution became slightly colored. **Make notes.**

11. Look at the wire that changed color, trace it back to the battery and determine the terminal (positive or negative) to which it is attached. **Make notes.**

12. Clean up.

Observations:

Step 7:

Step 8:

Step 9:

Step 10:

Step 11:

Conclusion: