

LAB 2 Effective Use of a Bunsen Burner

Use with
Section 4

During many investigations we will need a source of heat, in the chemistry lab we usually use a Bunsen burner to achieve this. In this activity, you will test the effective use of a Bunsen burner. You will vary the height of the position of a sample of copper wire, record your observations, and determine where is the hottest point of your flame is located. This hottest point is usually used when heating things in the chem lab.

Problem

Which portion of a Bunsen burner flame is the hottest, and therefore should be used for laboratory work.

Objectives

- Use a Bunsen burner correctly in a lab procedure.
- Heat a piece of wire using a Bunsen burner.
- Identify the parts of the Bunsen burner.

Materials

Copper Wire
Tongs
Bunsen burner
striker or matches
Small beaker with water

stopwatch or clock
with a second hand

Safety Precautions



- Always wear safety goggles.
- Tie back loose clothing, jewelry, and hair
- Assume all materials are hot and handle with tongs.
- Keep all combustible material away from open flame.

Pre-Lab

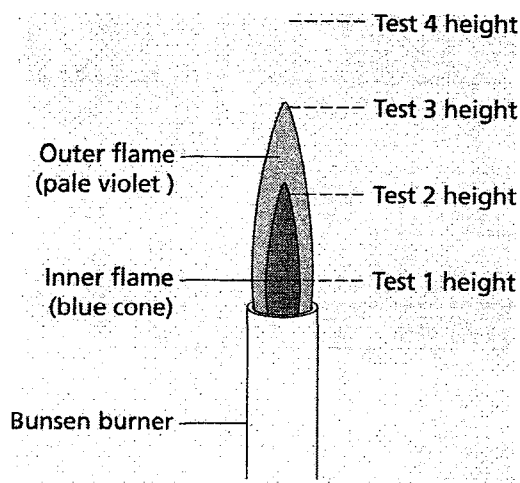
1. What are the constants in this experiment?
2. What are the variables in this experiment?
3. Which measurement in this experiment is the dependent variable?
4. Read over the entire laboratory activity. Hypothesize about where the hottest part of the flame will be. Record your hypothesis below.

Hypothesis

Procedure

1. Use burner connector safety tubing to connect the Bunsen burner to the gas inlet. Make sure the hose does not have any cracks or holes. Make sure the burner is sitting flat on the table.
2. Light the burner by first turning on the gas flow and using the striker to ignite the gas. If you use a match, light the match first before turning on the gas. Hold the match close to the top side of the burner barrel to light the gas.
3. When the flame is lit, adjust the gas flow and oxygen flow so that the flame is blue with an inner light-blue cone. A yellow flame is too cool and needs more oxygen. Your teacher may have additional directions on the operation of the Bunsen burner.
4. After you adjust the flame, **and** you see a flame that looks like Figure A you will start your tests.

WARNING: Gauze and burner are hot!

Lab 2 (continued)**Figure A**

5. Using a pair of tongs to hold the wire, place the wire in the flame at test height 1. This should be just above the barrel of the burner. Record the time it takes for the wire to turn orange/red. As you are heating make some observations of the flame and the wire, record them in the observation section.
6. Dip the wire in the beaker of water to cool it before the next test.
7. Place the wire at test height 2, record the time it takes for the wire to turn orange/red. Record any additional observations in the proper section.
8. Dip the wire in the beaker of water again to cool it before the next test.
11. Repeat steps 5–8 for the remaining 2 test heights. Record your observations in the proper section.
12. Turn the gas jet off, through your wire sample and any used matches in the trash receptacle at your table. Clean up your work station.

Data and Observations

Data Table 1	
Height	Time for Color to appear
1	
2	
3	
4	

Data Table 2	
Test Height	Observations of Flame and wire
1	
2	
3	
4	

Analyze and Conclude

1. **Thinking Critically** Was your original hypothesis supported by the data you collected? What evidence do you have to justify your response?

Lab 2 (continued)

2. Thinking Critically Why was the height at which we held the wire in the flame the independent variable?

3. Thinking Critically Why is the time to get the wire to change color the dependent variable?

4. Comparing and Contrasting What observed differences did you note among the results of the four tests?

5. Drawing a Conclusion Why did it take less time for the wire to turn colors when it was placed at the tip of the inner blue cone?

6. Thinking Critically Why was it necessary to use tongs to hold your wire sample? What does this tell you about heat transfer?
