

CHEMISTRY LAB: INTRODUCTION TO THE LABORATORY BURNER

WHAT TO TURN IN: Hypothesis, Data Entry 1 (labelled sketch), Conclusion, Error Analysis, Questions 1-8

Objectives

- To learn the parts of the laboratory burner.
- To review and observe fire safety rules.
- To turn the burner on and off safely.

Introduction

Sometimes a flame is required in the laboratory. Burners are used to heat substances, sterilize equipment, dry equipment, bend glass tubing, and perform flame tests.

There are different types of laboratory burners. Bunsen burners are used for general heating. Meker burners are used when a hotter and larger flame is needed. Tirrill burners are used for more precise control of the flame.

Methane is a major component of natural gas. The chemical reaction for the burning (complete combustion) of methane is $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$

Materials

laboratory burner with tubing, matches, flint striker, safety glasses/goggles

CAUTION!

- secure long hair, loose clothing, and long pieces of jewelry
- wear safety glasses/goggles
- stay away from leaning into a lit burner
- always have someone watching a lit burner
- adjust the flame as needed
- turn burner off at the source (gas valve)
- make sure your gas valve is turned off when you're finished

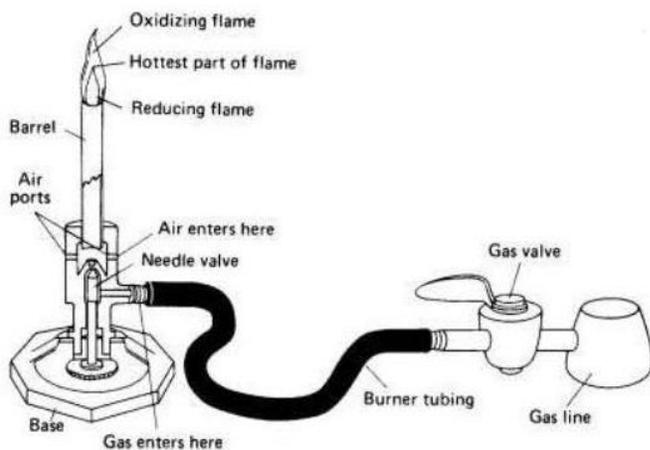
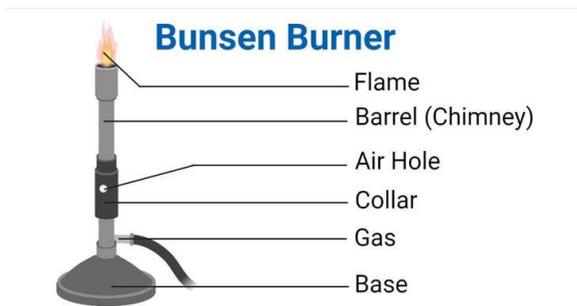
Procedure

- 1) Review fire safety rules (see Questions section).
- 2) Examine the gas jet valve. The handle is turned to the left or the right side for the OFF position.
- 3) Obtain a Bunsen burner. Locate the following parts: base, collar, air holes/slots, tubing, gas jet valve. Make a labelled sketch of your burner for Data Entry 1.
- 4) Carefully connect rubber tubing to the gas nozzle and burner so that the burner stands stable.
- 5) Obtain a flint striker and matches. Most flint strikers are composed of a piece of steel and a flint surface. Squeezing the handle will scrape the steel against the flint, causing sparks which can ignite the gas stream. Practice creating a spark.
- 6) To turn the gas ON, move the gas jet handle so it is parallel with the gas valve outlet. There should be a faint hissing sound from gas flow.
- 7) Immediately hold the striker over the barrel of the burner. Squeeze the handle to scrape the steel over the flint, directing the sparks into the gas stream to ignite it.
ALTERNATE 7): Light a match away from the burner. Quickly move the flame into the gas stream to ignite it. Blow out the match.

If you can't light the burner within 15 seconds, close the valve and clear the air.

- 7) Adjust the air vents on the barrel of the burner. For the hottest flame, open the air vents until the yellow flame turns light blue and has a visible inner dark blue cone. There should be as little orange or yellow as possible. A large, tall yellow flame indicates more air flow is needed. The flame should not roar loudly.
- 8) Adjust the gas flow at the gas jet if needed. If the flame blows itself out, this indicates too much gas is flowing. Close the valve and start over. If the flame “sinks” and begins to burn inside, turn the burner off at the gas valve immediately. Some burners have a separate knob or wheel for adjusting the gas. The Eisco natural gas burners do not.
- 9) When finished, turn the burner off at the gas jet by moving the handle to either side. Make sure the flame is extinguished before leaving the lab station.

OUR CLASSROOM BUNSEN BURNER



ON POSITION vs. OFF POSITION

Source: Wayne State University

Questions

- 1) Summarize how to use a fire blanket on someone who has caught on fire.
- 2) Summarize how to use a fire extinguisher in the classroom.
- 3) Look up the definition of “pyrophoricity.” How does it apply to this lab?
- 4) Give three uses of a laboratory burner.
- 5) Write the chemical reaction for the burning of methane.
- 6) Describe the appropriate flame of a Bunsen burner.
- 7) Describe how to adjust the flame if it is tall and yellow.
- 8) Describe what to do if the burner flame blows itself out.