Bunsen Burner Lab

Purpose:

- To learn how to operate a Bunsen burner
- To investigate combustion (a chemical change)

Pre-Lab:

Tape the pre-lab sheet into your notebook and label the parts of the Bunsen burner/

PART A

Procedures:

- Light the burner by holding a lighter next to the barrel of the burner and turn on the gas. (Gas flows when the handle is parallel to the spigot.)
- There are two points of control of the burner: the barrel and the wheel. Be careful making adjustments as turning these pieces too far will disassemble the burner itself.
- This experiment should be done with caution, NO GOOFING OFF!

Questions:

1. How does adjusting the barrel affect the nature of the flame?
2. Write a description and draw a picture of the flame. Include color.

PART B

Procedures:

- Adjust the amount of gas that flows through the burner by rotating the wheel at the burners base. DO NOT completely unscrew the control knob (wheel).
- The knob controls a valve that regulates the flow of gas. You should never leave a burner turned off at this point or adjusted too high as it poses a danger to the next person who lights the burner.
- Use the control knob at the base of the burner to adjust the flame to a max of 4 in to 10 cm.

Questions:

3. What happens to the flame height when you make adjustments to the control knob?

PART C

Procedures:

- The proportion of gas to air in the mixture determiners the flame's temperature. Lean mixtures (high air/low gas) burn hot. Rich mixtures (low air/high gas) burn cool. The structure of the flame is a result of both the rate of flow and the richness of the burning mixture.
- Keep the burner set to a rich mixture (yellow flame).
- Using beaker tongs to hold a 250 L beaker half full of tap water over the flame and observe the beaker bottom.
- After recording your observations, clean the outside of the beaker.
- If soot forms on the beaker, then the combustion is incomplete- giving off carbon (soot). If no soot forms of the beaker than the combustion was complete- all the carbon joined with oxygen to form carbon dioxide.

Questions:

4. Did complete or incomplete combustion occur? Cite evidence from your observations.

PART D

Procedures:

- Turn the barrel upward to increase the air supply. You may need to adjust the gas supply if the flame is either too high or too low.
- Adjust the air supply so that the flame has an inner blue cone and the burner makes a low roaring sound.

Questions:

5. Write a description and draw a picture of the flame. Include color.

PART E

Procedures:

- Fill a clean 250 mL beaker ¾ full of tap water. Using the beaker tongs, hold the beaker over the burner and watch the condensation (water droplets) on the *outside* of the beaker.
- Turn the beaker off at the spigot.

Questions:

6. What is the source of the condensed water?
7. Did complete or incomplete combustion occur? Cite evidence from your observations.

PART F

Procedures:

- Push a straight pin through a match.
- Put the match/pin assembly into the center of the barrel of the burner and light the burner with a striker (NOT a match).

Questions:

8. Did the match ignite? Why?

PART G

Procedures:

- While the burner is still on, put a wire in the flame top of the flame and in the middle of the flame.
- Record your observations once the wire is red hot.
- Turn off the burner and put away the equipment. Make sure everything at your lab station is CLEAN and ready for the next group.

Questions:

9. What conclusions can be made about your observations in Part G?

Summary:

Write a summary that includes the difference in flame structure found in a yellow and blue flame, how to use the burner effectively, and safety consideration.