

Complete and Incomplete Combustion Lab Activity - Student Edition

The Products of Combustion

Background Information:

When fuels react with oxygen in the air, they burn and release large amounts of energy in the form of heat and light. The amount oxygen available affects whether a fuel will undergo complete or incomplete combustion. For a fuel to undergo complete combustion, plenty of oxygen must be present in order to make the products carbon dioxide and water. If there is insufficient oxygen then the fuel will undergo incomplete combustion, producing carbon (a black powdery solid also called soot), the poisonous gas carbon monoxide and water.



Learning Objectives:

- To test for the products of combustion
- Identify complete and incomplete combustion.

Pre-Lab Questions:

1. Write the word equations for:
 - a) Complete combustion: _____
 - b) Incomplete combustion: _____

2. Is combustion an example of a chemical or physical change? Give a reason for your answer.

3. Describe how carbon dioxide can be tested for.

Equipment Needed:

- | | | |
|--------------------|----------------------------------|--------------------------|
| • Tea light candle | • 250ml beaker | • Retort stand and clamp |
| • Ice | • 2 boiling tubes with a rack | • Glass funnel |
| • Cold water | • 2 double-holed rubber stoppers | • Glass tubing |
| • Lime water | • Lighter or matches | • Pump |

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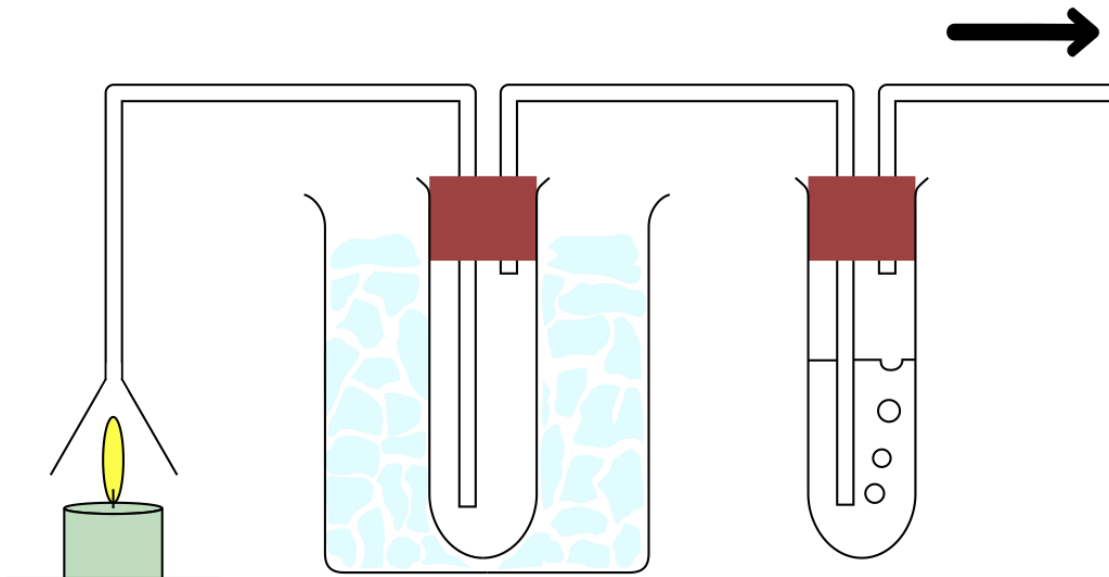
Safety:

- Safety glasses must be worn for the whole activity.
- Limewater is an irritant.

Method:

1. Setup the equipment as shown in the diagram below.
2. Light the tea light candle and carefully position it under the funnel.
3. Start the pump.
4. Record observations in the space provided.

A pump is used to draw the gases through the apparatus



Observations:

Name: _____ Period: _____ Date: _____

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Post-Lab Questions:

1. Name the product formed in first boiling tube.

2. Name the product formed in the second boiling tube. How can you confirm the presence of this product?

3. Name the fuel in this experiment.

4. Is this experiment an example of complete and incomplete combustion? Give a reason for your choice.

5. Are there any other observations (e.g., residue present or absent) which confirm your answer in question four?

6. If the tealight candle was placed in an enclosed chamber instead of under a funnel and the test was carried out again, what would you expect to observe?
