

# COMBUSTION

## PURPOSE

## HYPOTHESIS

## MATERIALS

- bunsen burner
- coal
- fire extinguisher
- safety precautions
  - hair
  - ventilation
  - rag of science
  - chairs tucked in
  - safety goggles
  - quiet

## RESEARCH

Combustion reactions generate energy when hydrocarbons like coal, gasoline, methane, or propane combine with oxygen to produce water, carbon dioxide and energy.

Fire extinguishers fight fires by removing either the fuel, oxygen, or heat. Fires and fire extinguishers are both classified by their fuels, A, B, C, or D

CLASS	FUEL	EXTINGUISHER
A.	solids (wood)	water (heat)
B.	liquids (gasoline) or gas (methane)	carbon dioxide (O <sub>2</sub> )
C.	"live" electric circuits	dry chemical (fuel)
D.	burning metals	dry polymer of salt (fuel)

## PROCEDURE

1. Observe the combustion of methane by igniting your bunsen burner.
2. Observe the combustion of coal by holding a small piece in the flame with the crucible tongs. Place the coal on the foil plate and cover it with the jar.
3. Observe the igniting of magnesium by your teacher.
3. Observe the release of material from a fire extinguisher.
4. Light a candle in a petri dish full of water. Cover the candle with the jar. Observe.

## DATA

1. Methane is CH<sub>4</sub>      Ethane is C<sub>2</sub>H<sub>4</sub>      Propane is C<sub>3</sub>H<sub>8</sub>      Butane is C<sub>4</sub>H<sub>10</sub>
- Which hydrocarbon is in this combustion reaction?  $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O + \text{heat}$

2. Why are combustion reactions also called oxidation reactions?

3. Gasohol is gasoline mixed with alcohol and has this chemical formula: CH<sub>3</sub>CH<sub>2</sub>OH

Write a chemical formula for the combustion (oxidation) of gasohol.

4. When not enough oxygen is available, the combustion reaction is incomplete. Carbon Monoxide and unburned carbon (soot) as well as carbon dioxide and water vapor are made.

Why is good ventilation so important when burning stuff?

5. What Class fire extinguisher do we have in our lab?

6. What fossil fuels were oxidized during this lab?

7. How much oxygen is in air? How did the candle in the petri dish prove this?

(hint: 2 objects cannot occupy the same space at the same time.)

## ANALYSIS AND CONCLUSION