Comparing Fuel Values - Lab Procedure

Purpose

The amount of energy (measured in joules, J) released per gram of fuel is known as the fuel value. The purpose of this investigation is to determine and compare the fuel values of different types of fuel.

Hypothesis

On the Lab Data Sheet, make a hypothesis about which type(s) of fuel will have the highest fuel value.

Materials

Fuel source (Kerosene, Isopropanol, Methanol, Ethanol, Paraffin/candle wax)

Aluminum can	Balance
Ring stand with ring	Clamp for thermometer
Spirit lamp / Alcohol burner	Matches/lighter
Water	Glass stirring rod
Thermometer/temperature probe	Graduated cylinder

Procedure

1. Use the balance to find the initial mass of the fuel source you will be investigating, and record the mass in Table 1 on the Lab Data Sheet.
2. Use the graduated cylinder to measure 300 mL of water. Put the water in an empty aluminum can.
3. Suspend the aluminum can from the ring stand by holding the can under the ring clamp so the attached tab goes through the ring. Place the glass stirring rod through the hole in the tab above the ring clamp so the can is hanging from the glass stirring rod supported by the ring clamp. Adjust the height of the ring clamp so the flame of the fuel source will be directly under the hanging aluminum can.
4. Use the thermometer or temperature probe to measure the initial temperature of the water. Record the temperature in Table 1 on the Lab Data Sheet.
5. Light the wick of the fuel source and place it under the can of water. The flame should be very close to the bottom of the can.
6. Let the fuel source burn for 5 to 10 minutes.
7. Extinguish the fuel source and use the thermometer or temperature probe to measure the final temperature of the water. Record the temperature in Table 1 on the Lab Data Sheet.
8. Use the balance to determine the final mass of the fuel source. Record the mass in Table 1 on the Lab Data Sheet.

References

Flinn Scientific. (2016). *Soda can calorimeter.* Publication No. 10861. Flinn Scientific. https://www.flinnsci.com/api/library/Download/f9560a5fc7ef4a6b8f4598fea30626eb?srsltid=AfmBOoqPqLwA9oHjW7ryr56_3dVvNf5iU-BABz3JzAL4WEl9gSQ4hArg

Wells, E. (2009). *Alternative transportation fuels.* Lab Manual for Environmental Science. Brooks/Cole, Cengage Learning.