CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
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Project Number
J0611

Project Title
Fuel and Fire: Analyzing Tomorrow's Power

Abstract

Objectives/Goals
The purpose of this experiment is to see the differences in burning time, caloric energy, and carbon emissions of gasoline, diesel, and ethanol.

Methods/Materials
Materials: 1 teaspoon Diesel, 1 teaspoon Ethanol, 1 teaspoon Gasoline, Stop watch, 1 muffin tin (to light the fuel in), Funnel, Plastic syringe,Celsius thermometer, Closeable test tube, Small metal cup, Matches, Carbon dioxide detection Titration kit
Methods:
Experiment 1 - Caloric Energy Released and burning time
1. Set out the muffin tin in a safe, well ventilated area. 2. Place 1 teaspoon of first fuel in a cavity of the muffin tin. 3. Place a small metal cup on top, filled with 30mL of room temperature water. 4. Place the thermometer in the cup and make sure that it is 13A°C. 5. Light the first fuel on fire, and observe the temperature reading on thermometer. 6. When finished burning, record the highest reached water temperature and stop the timer. 7. Repeat steps 2-6 for the next two fuels. 8. Calculate the calories released from each fuel by multiplying the change in temperature by 30. 9. Record the burning time per fuel.
Experiment 2 - Carbon Emissions released
1. Complete steps one and two from experiment one. 2. Light first fuel on fire using the matches. 3. Quickly place the funnel with the syringe on top. The funnel should be slightly raised over the burning fuel. 4. Make sure to only draw in the smoke coming from the fuel into the syringe. 5. When the fuel stops burning, take out the syringe and inject the smoke into the closable test tube that has 20mL of water in it. 6. Close the test tube and gently shake it to mix the water and smoke. 7. Follow directions on Titration kit. 8. Repeat steps 1-7 for next two fuels.

Results
Diesel showed the highest in all the tests and ethanol was the lowest in all of the tests except for burning time.

Conclusions/Discussion
There is no easy answer to which fuel is the best one to use. While diesel has more energy and burns for the longest time, ethanol does not release very much Co(2), as diesel does, but it doesn't have very much energy or burn for as long. Gasoline was mostly in the middle for all of the tests. It is the most commonly used.

Summary Statement
The purose of this experiment is to see the differences in burning time, caloric energy, and carbon emissions of gasoline, diesel, and ethanol.

Help Received
Father was adult supervision, Leighann Work helped edit final paper