CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J0207

Project Title
Biodiesel Fuel: How Viable?

Abstract

Objectives/Goals
Biodiesel can be used to lessen our dependence on fossil fuels and decrease our carbon footprint and carbon emissions. If all the cooking oil is converted to Biodiesel, it will meet 2% of our energy need and will have much less carbon emission in environment.
My objective is to produce biodiesel from vegetable, corn and see how effective they are as a fuel.

Methods/Materials
Materials used are Sodium Hydroxide, Methanol, 1 lit each of Soybean, Corn and Vegetable oil.
Accessories like glass containers, measuring cups, coffee filters, safety glass, latex gloves, thermometer, stopwatch, and funnel were used.
Method - 5 grams of sodium hydroxide(NaOH) and 220 mL of Methanol were mixed gently to make Methoxide Solution. Vegetable oil is heated to 130 F and mixed vigorously with Methoxide Solution. After 5-6 hours, a lighter layer at the top will appear, which is the biodiesel, and a darker layer, glycerol, at the bottom. Biodiesel is further cleaned with distilled water and coffee filters.
Repeat these steps, with Soybean and Corn Oil to produce Biodiesel from these sources.

Results
Biodiesel from Soybean oil shows the best results. It ignites quicker, is the clearest, and has the least viscosity. Soybean Biodiesel is not as good as Petro-diesel.

Conclusions/Discussion
I concluded that biodiesel is a completely viable and alternative energy source.
Its economical - 50 to 60 cents per gallon in bulk quantity.
Its environmentally friendly - 20 lbs. less CO_2 per gallon of Biodiesel.

Summary Statement
How viable is it to produce Bio-Diesel from cooking oil.

Help Received
Dad brought in some of the raw material for the project.