



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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Project Title Used Coffee Grounds: A New Source of Fuel	
<p style="text-align: center;">Abstract</p> <p>Objectives First, to discover an alternative, eco-friendly biodiesel fuel in place of petroleum or other fossil fuels we use today. Second, to find a way to reduce the input into landfills. This is done by transforming a previous waste product into something useful that will benefit our environment. We found that we could turn used coffee grounds into a cleaner biodiesel.</p> <p>Methods Three main procedures: extraction, distillation, and testing the energy. Extraction: soxhlet extraction apparatus, used coffee grounds, hexane-our solvent. Distillation: distillation tube to reuse hexane. Test energy: calorimeter, bohning alcohol burner, specific heat formula. Test for different cuts of coffee gounds</p> <p>Results We found that the medium cut coffee grounds produced more oil than the coarse ground coffee. However, the coarser cut coffee had more energy than the medium ground coffee grains. Overall this experiment only took two hours and the hexane and water we used can also be recycled for further experiments.</p> <p>Conclusions Medium cut grounds produce more oil because of the larger surface area. Hexane can extract oil from used coffee grounds, thus formulating a biodiesel. Our oil can be easily used as fuel for nearly anything and in mass production, will get the most out of the used coffee grounds. Although our process takes energy, the biodiesel will release less carbon emissions than petroleum.</p>	
Summary Statement We turned used coffee grounds into a biodiesel in order to reuse a waste product that results in a fuel that is cleaner for our environment.	
Help Received Our chemistry teacher bought us the needed supplies and supervised our experiment. Otherwise than that, we all of the work ourselves.	