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*Energy Content In Different Biodiesel*

Do different plant oils contain different energy contents? By making biodiesel fuel from plant oils, it is possible to burn the oil and find the amount of energy each oil contains. It can be done by using a calorimeter, a device used to measure the heat of chemical reactions. Energy can be found by using the heat equation:  $Q_{\text{water}} = (m)(C_p)(\text{change in temperature})$ . Five plant oils, Olive Oil, Corn Oil, Canola Oil, Soy Bean Oil and Peanut Oil, were each made into biodiesel and burned in a calorimeter. The heat energy was determined by burning 1mm of each biodiesel in a calorimeter, where the change of temperature was found. The mass(m) was determined by measuring the mass of 10mm of each biodiesel and then dividing it by ten. The specific heat( $C_p$ ) of distilled water is 4184 J/g degrees Celsius. With all this data it can then be entered into the heat equation to find the heat of the water, or the amount of energy contained in biodiesel. Even though Canola Oil contained the highest amount of energy it was not the cheapest. So then, another question arose. Biodiesel made from which oil is the most economical? The price was observed for each oil per Liter. Canola oil ended up costing \$3.02/L ranking the third most expensive oil. Out of the tested oils, it was determined that Corn Oil was the most economical, containing one of the three highest amounts of energy and a lower cost per Liter.