Analysis of Acidic and Basic Catalysts on the Transesterification of Wasted Grease

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This research was based on previous research conducted on obtaining biofuels from various food waste sources. It was determined that wasted grease was the best source for biofuel production. This research focused on the most effective catalyst for biodiesel production. The objectives were focused on mitigating costs, so the most cost effective catalysts were selected, which are primarily acidic and basic solutions. Based on research in industrial settings, it was hypothesized that basic catalysts would prove more effective. Testing followed thereafter, with equal amounts of concentrated solutions of catalysts being added to methanol and grease at 60o C to further increase reactions. Following the process of transesterification, the fuel was extracted and washed. Calorimetry tests were performed to evaluate the energy output of each sample. With the exception of Magnesium Hydroxide which was insoluble, the basic catalysts created a higher yield of fuel than the acidic catalysts. The acidic catalysts produced a higher energy output per gram of fuel than the basic catalysts did. For profitability on an industrial scale, it can be concluded the costs of continually replacing corroding pipes caused from an acidic catalyst exceeds the costs of washing fuels from a basic catalyst. It was concluded basic solutions are better catalysts than acidic solutions for cheaper production and larger fuel yields.

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