

Biodiesel Production by Base Catalyzed Transesterification of Soybean Oil

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Abstract

A technical and economic investigation of a biodiesel production facility is presented. Production involves soybean oil and methanol undergoing transesterification with sodium hydroxide catalyst in a batch reactor absent of water. A 99% feedstock to product conversion is anticipated, calculated on the basis of a 99.99% triglyceride composition of soybean oil. Following transesterification, production is completed by liquid phase partitioning of the crude biodiesel (methyl esters) and crude glycerin products, and then removal of volatiles from the fuel product in a continuous flash separation section. The production level investigated for the facility is 10 million gallons of biodiesel annually, with the product meeting ASME specification for B100 Biodiesel fuel. This grade of biodiesel produces 48% less carbon monoxide emissions than conventional diesel. The facility presented captures 1.93% of projected 2008 domestic biodiesel production and seeks to satisfy the primary objectives of the U.S. Department of Energy's Renewable Energy Biomass Program.

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