



Production of biodiesel by transesterification: a green approach to energy

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Abstract

Research on producing biodiesel from leftover cooking oil has increased due to a constant increase in demand for renewable energy sources and the necessity of sustainable waste management. If spent cooking oil is left out in the open, it can cause a number of environmental issues. In this study, a transesterification technique is used to try and convert used cooking oil which is gathered from different sources, into biodiesel. Transesterification, a process that uses waste products to produce valuable renewable energy and glycerol as a by product, has proven to be a potential and sustainable method for production of biodiesel from used cooking oil. Experiments were conducted to produce biodiesel using leftover groundnut and sunflower oil. In order to produce biodiesel from the aforementioned oils, a number of parameters were examined, including temperature of reaction, alcohol-to-oil molar ratio and reaction time. When compared to traditional biodiesel, it exhibits superior qualities in terms of aniline point, flash point, pour point, smoke point, cloud point, and fire point. It is found that the biodiesel yield from waste sunflower oil is more than that of waste groundnut oil. With no engine modifications required, biodiesel may be used in diesel engines in both blended and raw form as an excellent alternative to conventional fuels.

Keywords Biodiesel · Waste cooking oil · Transesterification · Cetane number · Engine

1 Introduction

Today, the energy sector of any country depends on the conventional fuel sources for the agricultural, transportation and industrial sector. The limited availability of conventional fuels, increase in demand and industrialization has led to the depletion of these fuels [1]. The increasing oil prices and the depletion of reserves led to finding alternative sources of energy

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