

The Biodiesel Production from Various Vegetable Oils with Ultrasonic Method

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Ultrasonic method is considered to be an effective method to increase the mass transfer between the immiscible liquid-liquid phases in a heterogeneous system leading to faster transesterification and higher yield, less energy consumption, and it saves excess methanol and catalyst. In this study, biodiesel from hazelnut oil and a mixture of hazelnut oil with other vegetable oils was produced in ultrasonic media using frequency 20 kHz (200 W) homogenizer at autogenic temperature. For hazelnut oil, reaction conditions were selected as 0.5-1.5 % KOH catalyst, 20 min reaction time, methanol:oil molar ratio of 3:1-9:1. The highest yield and conversion were obtained as 92.8% and 98.12%, respectively, at 5:1 methanol:oil molar ratio, 1% KOH:oil ratio (w%). Also, the mixed vegetable oil: 40% corn oil, 30% sunflower oil and 30 %hazelnut oil, was used to produce biodiesel. The highest yield of 91.87% and highest conversion of 99.21% were obtained at 5:1 methanol: oil mol ratio, 1% KOH catalyst ratio, in similar to hazelnut oil optimum conditions.

Keywords: Methyl ester, biodiesel, ultrasonic method, hazelnut oil, sunflower oil, corn oil.