

Utilization of hazelnut oil to produce biodiesel

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Biodiesel production generally involves the transesterification of vegetable and/or animal oils with alcohol and catalyst under conventional stirring with batch and/or continuous processes. In recent years, because of the economical causes, choosing efficient transesterification method for biodiesel production has become important. Using microwave method for the transesterification reaction supports high yields of highly pure products within a short time and a severe reduction in the quantity of by-products when compared to the conventional methods. The new usage area for hazelnut oil, a vegetable oil based on oleic acid, is also presented with this study, considering that Turkey, as having the 73% of world production, is the leader in the production of hazelnut and potential of hazelnut oil. In this study, hazelnut oil was characterized to research the potential for biodiesel production and compared with biodiesel product obtained from hazelnut oil with microwave method. Methyl ester content of biodiesel samples obtained under different conditions increased with an increase in methanol/oil molar ratio, catalyst concentration and reaction time; whereas monoglyceride and diglyceride content decreases. The highest methyl ester content of biodiesel product was obtained as 99.678 % with methanol/oil molar ratio of 15:1; KOH catalyst concentration of 1.5 wt% and reaction time of 10 min.

Keywords: Hazelnut oil, microwave method, transesterification, methyl ester, biodiesel.