

## Esterification of Oleic Acid Catalyzed by Ionic Liquid using Ultrasonic Method

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### Abstract

One of the most important environmental problems today is pollution resulting from the use of fossil fuels [1]. Biodiesel has been widely used as an alternative to fossil fuels and can be produced by transesterification of triglycerides or esterification of free fatty acids[2,3]. In this study, esterification of oleic acid was performed using 1-butyl-3-methylimidazolium hydrogen sulphate ([Bmim][HSO<sub>4</sub>]) and 1-methyl imidazole hydrogen sulphate ([Hmim][HSO<sub>4</sub>]) ionic liquids (ILs) for green biodiesel production. In this way, in order to improve the efficiency of biodiesel production from esterification of free fatty acids, alternative catalysts to acidic and basic homogeneous catalysts have been investigated. The effect of the methanol/oleic acid ratio, reaction time, and catalyst dosage on the esterification of oleic acid was investigated. Within the parameters tested, the most effective parameter is the amount of ionic liquid and it has been found that the yield of methyl oleate increases with the increase in the amount of ionic liquid. It was determined that [Bmim][HSO<sub>4</sub>] was the most efficient ionic liquid used for the esterification of oleic acid compared to [Bmim][HSO<sub>4</sub>].

**Keywords:** biodiesel, esterification, ionic liquids, green chemistry.

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### ACKNOWLEDGEMENTS:

The authors thank the Research Fund of Mersin University in Turkey with Project Number: 2016-2-TP2-1814

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