

Production of biodiesel from waste cooking oil by using Mahogany husk ash and CaO as catalyst

Ratnaweera C.N.*, Pulle P.D.P.D., Karunarathna A.G.S.S.

Department of Chemistry, University of Ruhuna, Matara, Sri Lanka

Biodiesel is an alternative fuel that is made from biological sources. Hence it is a renewable fuel. Biodiesel is generated through a process called transesterification where a variety of feedstock containing fat and oil are treated in the presence of an alcohol such as methanol. Homogeneous catalysts such as NaOH or heterogeneous catalysts such as CaO are used speedup this reaction. We generated biodiesel from used cooking oil after a pretreatment process and using a novel catalyst from Mahogany fruit husk ash and coral rubble. We proposed Mahogany carpel ash as the catalyst because it contains about 20 % CaO and a porous silicon structure. Initially, waste cooking oil was purified using activated charcoal to reduce the free fatty acid content. For comparison purposes, we prepared biodiesel from conventional catalysts NaOH and CaO, resulted 89.31% & 78.18% yield percentages separately. The catalyst was improved by incorporating CaO from the corral via wet impregnation method. A64.99% yield of biodiesel was obtained with this novel catalyst, though the yields were less than from NaOH catalyst. Density of the biodiesel produced with the new catalyst is 918 kgm^{-3} , almost same as the product obtained with NaOH catalyst. 12.26 & 0.74 (mg KOH/g oil) saponification and acid values were obtained for the novel mahogany ash catalyst indicating that less soap formation. The novel natural catalyst we produced using Mahogani fruit husk ash is successful and can be further developed as efficient catalyst to produce biodiesel from waste coconut oil.

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*Corresponding author: nadun@chem.ruh.ac.lk