

Green approach for conversion of industrial wastes to biofuel over egg-shell CaO catalyst

Kithulgoda H.N, Edussuriya M.* and Ranaweera A.S.

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

In this work biofuel was produced by esterification of coconut oil extracted from the waste scraped coconut using two methods *viz* non-microwave and microwave methods. CaO catalyst was prepared by treating waste chicken egg shells and the catalyst support which is H₃PO₄ acid activated carbon (AC) was prepared by using sugarcane bagasse. CaO content of the egg shells derived CaO was determined by EDTA titration and compared with that of commercial CaO. According to the results obtained, the best catalytic activity was found under the condition of, CaO: AC (w/w) 1:1, oil:methanol (mol/mol) 1:12 and 2% CaO (w%) catalyst. In the microwave method biofuel was formed in 97% yield upon exposure to microwave radiation for just 5 min. The biofuel produced from coconut waste was characterized by determining the pH, density, total acid content, iodine value and ash content and the values were well agreed with the standard ASTM parameters. In conclusion it is clear that a few readily available industrial wastes can be efficiently used to produce biofuel economically under environment friendly conditions.

Keywords: Biofuel, CaO catalyst, Activated carbon, sugarcane bagasse

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