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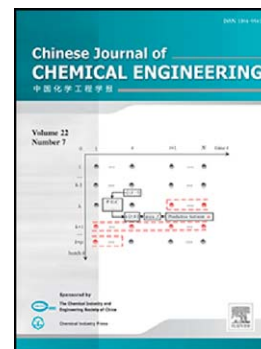
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Small Scale Biodiesel Synthesis from Waste Frying Oil and Crude Methanol in Morocco

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Abstract

Biodiesel was produced at small scale by transesterification of used frying oil (UFO) recovered from Moroccan pastry shops and fish frying restaurants. Biodiesel was first synthesized at laboratory scale in order to optimize the transesterification parameters. The cost of the final product was also optimized using low-cost raw materials. The UFO and the produced biodiesel were characterized with several techniques including gas chromatography, ¹H-NMR, ¹³C-NMR, FTIR, and TGA-TDA techniques. ¹H-NMR gas chromatographic analyses of the final product confirmed that the transesterification in the chosen experimental conditions was completed. These results were confirmed by TGA-TDA analysis used as new techniques to monitoring triglycerides conversion. The biodiesel did not contain any trace of glycerol, and it did meet the international standards. The transesterification at low cost in small scale conditions was performed at 60°C using 1.2% of KOH and methanol/oil molar ratio of 6:1. A yield of 80.8% was achieved. The properties of the produced biodiesel were found to be as good as those of biodiesels obeying to European standards. The biodiesel production was also performed at small-scale for individual

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