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Synthesis of Environmental Benign Biodiesel from Waste Cooking Oil †

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Abstract: Biodiesel is an alternative source of renewable fuels for economic development and a clean environment. It is a renewable and environmentally benign green fuel, which can be produced from vegetable oils, animal fats, and waste cooking oil (WCO) by transesterification process using different types of catalysts such as homogeneous, heterogeneous catalysts, and noncatalytic conditions. Production of biodiesel from vegetable oils is more costly than the cost of petrodiesel. Waste cooking oil can be used as an alternative and economical feedstock for reducing the cost of biodiesel production. Heterogeneous catalysts are mainly used for biodiesel production from WCO because the catalyst is easily separable from the product and readily reused, recycled, and regenerated. There are many factors:- temperature, kind of alcohol, the molar proportion of alcohol to oil, moisture content, free fatty acid content, catalyst concentration, which influence biodiesel production. The present study focues on biodiesel production using WCO and optimization of reaction parameters for effective yield. Among the catalysts used for biodiesel production from WCO, nano-sized CaO gives a good percentage yield compared to other catalysts.

Keywords: waste cooking oil; catalysts; transesterification; optimization; biodiesel.

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Conflicts of Interest

The authors declare no conflict of interest.