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Evaluation of biodiesel production in membrane reactor

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The continuous technological development implies for developed and developing countries the search for new forms of alternative energy that are renewable and less polluting, replacing fossil fuels in order to meet the environmental requirements required. In this context, biodiesel appears as a promising source for the total or partial substitution of fossil diesel. The biodiesel production via continuous processes seeks the feasibility of industrial production. Currently, membrane reactors are employed in the production of biodiesel in order to reduce production cost by improving the purification processes as well as reducing the generation of potentially polluting effluents. This work aimed to evaluate the production of biodiesel from the transesterification of soybean, via alkaline reaction, in the continuous flow reaction system with membrane separation. It was developed a 2^3 factorial design to investigate the influence of the catalyst concentration, molar ratio of oil/methanol and the reaction temperature on the conversion into esters. It was found that the highest ester conversion was 97.93% and it was obtained using catalyst concentration 1% (w/w), the molar ratio oil/methanol 9/1 and the reaction temperature 60°C. Finally the physicochemical characterization of biodiesel was performed according to the requirements of the Brazilian National Agency of Petroleum, Natural Gas and Biofuels, regarding to the levels of mono, di and triglycerides, glycerol, specific gravity, acid value, viscosity and cold filter plugging point. According to the characterization results, a good quality biodiesel was obtained using the membrane reactor system.

Biography

Ana Katerine de Carvalho Lima Lobato has a bachelor's degree in Chemical Engineering from the Federal University of Rio Grande do Norte, Natal, Brazil (1999), a master's in Chemical Engineering from the Federal University of Rio Grande do Norte, Natal, Brazil (2003) and a Ph.D. in Chemical Engineering from the Federal University of Rio Grande do Norte, Natal, Brazil (2010) with a sandwich period at the University of Manchester, United Kingdom. Currently, she is a researcher and an assistant professor in the Post-Graduate Program in Chemical Engineering at the Federal University of Bahia. Her research interests cover the following subjects: petroleum, biofuels, biosurfactant production, antibiotic production and metabolic flux analysis.

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