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Abstract:

The identification of the influence of the reaction parameters is of paramount importance when defining a process design. In this work, non-edible castor oil was reacted with methanol to produce a possible component for biodiesel blends, using liquid enzymes as the catalyst. Temperature, alcohol-to-oil molar ratio, enzyme and added water contents were the reaction parameters evaluated in the transesterification reactions. The optimal conditions, giving the optimal final FAME yield and FFA content in the methyl ester-phase was identified. At 35 °C, 6.0 methanol-to-oil molar ratio, 5 wt% of enzyme and 5 wt% of water contents, 94 % of FAME yield and 6.1 % of FFA in the final composition were obtained. The investigation was completed with the analysis of the component profiles, showing that at least 8 hours are necessary to reach a satisfactory FAME yield together with a minor FFA content.

Keywords: biodiesel; castor oil; transesterification; liquid enzymes; optimal reaction conditions