METHYL ESTERIFICATION OF FATTY ACID OLEIC AND STEARIC ACIDS EMPLOYING CATALYSIS IN HETEROGENEOUS MEDIUM

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Catalysis in heterogeneous medium excels in the production of biofuels, mostly for ease separation of the catalyst in reactional medium, lower toxicity and ease of handling. In this work, the methyl esterification of fatty acids, oleic and stearic acids, employing heterogeneous catalysts using in catalysis based on clay activated with phosphoric acid (Montmorillonite-SWy). The catalysts were prepared with acid concentration of 1 and 2 mol. L⁻¹ in 1 and 2 hours, under 100°C with subsequent washing. The method applied in esterification process consisted in adding the reagents (fatty acid, alcohol and catalyst) into a flat-bottomed flask, coupling it to a reflux system with 2 hours heating under reflux temperature of methanol. Then the catalyst and methanol were removed from the middle by centrifugation and rotaevaporation, respectively. Consequently, it was determined the final acidity index of array grease and calculated conversions of the reactions. Conversions obtained for the stearic acid were greater to those obtained for the oleic acid, contrary to the behavior reported in the literature. In addition, it was possible to observe a decrease in conversion when compared to the stericifications reactions of oleic acid and stearic acid, suggesting that such behavior is explained by the influence of steric hindrance when the interaction of oleic acid molecule with the surface of the catalyst, as it possessed a torsion angle caused by the presence of unsaturation which possibly prevented the total participation of heterogeneous catalyst in the reaction. Stearic acid, for being saturated, has no non-conformities throughout its linear chain, converting higher levels to methyl esters in the same fraction of time. In this study, the tests conducted have shown that clay-based catalysts activated have great potential to be used in esterification reactions in the production of methyl esters under mild reactional conditions.

Keywords: Clay, fatty acid, conversion.
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