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Note from the field

Utilization of palm fatty acid distillate in methyl esters preparation using $SO_4^{2-}/TiO_2{-}SiO_2$ as a solid acid catalyst

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ABSTRACT

The use of by-products, particularly in the biodiesel industry, has gained much attention owing to their potential in countering higher feedstock costs. A low-value by-product of palm oil refining, the palm fatty acid distillate (PFAD), was utilized as a feedstock for biodiesel preparation with the aid of a solid acid catalyst, $SO_4^{2-}/TiO_2{-}SiO_2$. A central composite design is applied to optimize the major influential manipulate variables. The analysis of variance identifies the methanol/PFAD molar ratio as having a dominant effect on methyl ester conversion, followed by catalyst amount and reaction time respectively. The utilization of PFAD with the aid of a solid acid catalyst results in 93.3 ± 1.02% conversion at the most optimized reaction conditions of 2.97 ± 0.04 wt% for the catalyst amount, 5.85 ± 0.14 methanol/PFAD molar ratio and 3.12 ± 0.14 h of reaction time.

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