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Improving the Yield of Biodiesel from Karanja Oil Transesterification using Nano Catalyst

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Abstract:Biodiesel is a promising alternating environmentally benign fuel to mineral diesel. Stable and active heterogeneous mixed metal oxide of KTiO_2 nanocatalyst was synthesized and exploited using karanja oil transesterification process for the development of easier transesterification process. The synthesized catalyst was characterized by XRD, and HRTEM studies for their structural characteristics. It was found that KTiO_2 nanocatalyst exhibits good catalytic activity. Also it was noticed that the catalytic performance was greatly depends on (i) Catalyst concentration (ii) Methanol to oil molar ratio (iii) Reaction temperature and (iv) Reaction time. A highest 84.5% of conversion was obtained at the optimum reaction parameters with 4% of catalyst loading and 7% potassium loading. The KTiO_2 nanocatalyst shows good catalytic performance, which could be a potential candidate for the large-scale biodiesel production from Karanja oil at the reduced temperature and time.

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