عنوان مقاله:

Kanemite: an easily prepared and highly efficient catalyst for biodiesel production optimized by response surface methodology

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خلاصه مقاله:

Kanemite was readily prepared and used as solid base catalyst for transesterification of sunflower oil to fatty acid methyl ester (FAME). The catalyst was characterized by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), N2 adsorption-desorption and field emission scanning electron microscopy (FESEM) techniques. Central Composite Design (CCD) coupled with Response Surface Methodology (RSM) was utilized to study the effects of the system variables such as catalyst amount, methanol to oil molar ratio, reaction time and specifically, the effect of interaction between process variables on the conversion of oil to biodiesel. Under the optimum reaction conditions (5 wt.% catalyst loading, methanol to oil molar ratio 22:1 and reaction time 240 min), the highest predicted and experimental fatty acid methyl ester conversions were 95.97% and 94.17% ,respectively. Besides, the reusability of the prepared catalyst was checked for five cycles under the optimal reaction conditions. No significant loss of the product yield was observed.

کلمات کلیدی:

Biodiesel, Kanemite, Transesterification, Solid base catalyst, Response surface methodology

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