Development and characterization of a composite anthill-chicken eggshell catalyst for biodiesel production from waste frying oil

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Abstrak

The primary aim of this research is to synthesis composite anthill-chicken eggshell catalyst, which is characterized and employed for the synthesis of biodiesel from waste frying oil. The as-synthesized catalyst was characterized using various characterization techniques, such as X-ray fluorescence (XRF), Fourier transform infrared radiation (FTIR), Brunauer–Emmett–Teller (BET) analysis, scanning electron microscopy (SEM), and Basicity. The influence of different reaction parameters on the catalytic reaction, reaction time, catalyst loading and reaction temperature in the range of 50–75°C were studied at fixed methanol/oil ratio of 6:1. The experimental data obtained showed that at reaction time of 2 h, catalyst loading of 5 wt% and reaction temperature of 60°C, the biodiesel yield was 70%. The synthesized catalyst was found to convert low-grade oil into biodiesel via a single-step transesterification process, and its activity has the potential for improvement.