

Heterogeneous Nanocatalyst for Biodiesel Production: A Novel and Integrated Approach †

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Abstract: Internationally emerging energy trend, depletion of existing fossil fuel reserves along with growing population and alarming pollution all together has diverted the research towards the use of renewable fuels such as biodiesel. Biodiesel being sustainable, biodegradable, sulfur-free, benzene-free, eco-friendly, and climate-neutral is a better alternative to vastly depleting petrodiesel fuels. Biodiesel is widely produced via the transesterification reaction of vegetable oil with alcohol in the presence of homogeneous or heterogeneous catalysts. Catalyst is a key factor that is known to affect the kinetics and output of transesterification reactions. The present review is an account of the widely used heterogeneous nanocatalyst for biodiesel synthesis. Heterogeneous nanocatalysts are novel for FAME synthesis as they are economical, recyclable, reusable, readily available, active and selective, non-corrosive, long-lasting, and conveniently separable. Critical factors such as reaction time and temperature, alcohol to oil molar ratio, catalyst loading, the intensity of mixing etc., have also been accounted for in the paper.

Keywords: biodiesel; catalysis; heterogeneous nanocatalyst; transesterification.

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Conflicts of Interest

The authors declare no conflict of interest.