

Biodiesel Synthesis Using Animal Excreta-Based Biochar and Waste Cooking Oil

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Abstract : This study laid an emphasis on the possible employment of biochar generated from pyrolysis of animal excreta to establish a green platform for producing biodiesel. To this end, the pseudo-catalytic transesterification reaction using chicken manure biochar and waste cooking oil was investigated. Compared with a commercial porous material (SiO₂), chicken manure biochar generated from 350 C showed better performance, resulting in 95.6% of the FAME yield at 350C. The Ca species in chicken manure biochar imparted strong catalytic capability by providing the basicity for transesterification. The identified catalytic effect also led to the thermal cracking of unsaturated FAMEs, which decreased the overall FAME yield. For example, 40-60% of converted FAMEs were thermally degraded. To avoid undesirable thermal cracking arising from the high content of the Ca species in chicken manure biochar, the fabrication of chicken manure biochar at temperatures $\geq 350\text{C}$ was highly recommended.

Keywords : Trasesterification, Animal excreta, FAME, Biochar, Chicken manure

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