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## Aluminum foil waste as catalyst for esterification of waste cooking oil

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## Abstract

In this study, aluminum chloride hexahydrate (AlCl<sub>3</sub>·6 H<sub>2</sub>O) was derived from aluminum foil waste as a heterogeneous acid catalyst in the esterification of waste cooking oil. The parameters of catalyst loading (2-8 wt%), ultrasonic frequency (12-40 kHz), and reaction time (15-60 min) were optimized for maximum biodiesel yield production. Under constant condition of methanol to oil molar ratio of 6:1 and temperature of 50 degrees C, a biodiesel yield of 91% was obtained at 2 wt% catalyst loading, 26 kHz ultrasonic frequency, and 40 min reaction time.

## Keywords

Author Keywords: Aluminum foil waste; esterification; waste cooking oil; solid catalyst; ultrasonic

KeyWords Plus: HETEROGENEOUS CATALYST; BIODIESEL PRODUCTION; TRANSESTERIFICATION

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