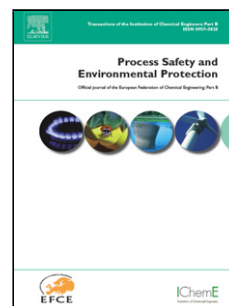


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## Kinetic analysis of transesterification of waste pig fat in supercritical alcohols

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### ABSTRACT

The kinetic analysis method using non-isothermal technique was proposed to determine the kinetic parameters for the transesterification reaction of waste pig fat in supercritical alcohols. To investigate the transesterification of waste pig fat, the waste pig fat to alcohol ratio (w/w) was varied from 1:1.5-1:2.5 between the temperatures 220-290 °C at an interval of 10 °C in a 25 mL batch reactor. The products were analyzed by gas chromatography mass spectrometry. To verify the effectiveness of the proposed kinetic analysis method, the experimental values were compared with the values calculated using the kinetic parameters obtained from this work. It was found that the proposed kinetic analysis method gave reliable kinetic parameters for the transesterification of waste pig fat in supercritical alcohols. Further, it was found that the apparent activation energy for supercritical ethanol was lower than the value for supercritical methanol.

Keywords: Kinetic Analysis; Transesterification; Supercritical Alcohols; Waste Pig Fat; Supercritical Methanol; Supercritical Ethanol

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## 1. Introduction

With the rapid increase in petroleum prices and concerns about environmental pollution, biodiesel has attracted extensive attention as an alternative fuel for petroleum diesel. Alternative fuels have the potential to solve the depletion problem of petroleum sources and concerns from air pollution and global warming to other environmental and sustainability issues (Demirbas, 2005). Many

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