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# Process enhancement of supercritical methanol biodiesel production by packing beds

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## Abstract

Continuous fixed bed reactors filled by three kinds of packing which were glass bead, glass spring and Dixon rings were investigated. The effect of temperature, pressure, the molar ratio of methanol to oil, flow rate, the size and shape of the packing were researched. The highest yield 90.84% of FAME was obtained by filling Dixon rings as packing with the condition of the temperature was 350°C, the pressure was 22MPa, the molar ratio of methanol to oil was 42:1. In addition, the reusability of Dixon rings was perfect. Numerical simulation was researched to provide theoretical basis for experimental results, besides the kinetics and thermodynamics behavior were investigated to explore the reaction mechanism.

Keywords: biodiesel; supercritical; fixed bed reactor; packing; kinetics

## 1. Introduction

The dwindling petroleum reserves and increasingly serious environmental problems demand a substitute for petroleum. Among all the potential alternatives,

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