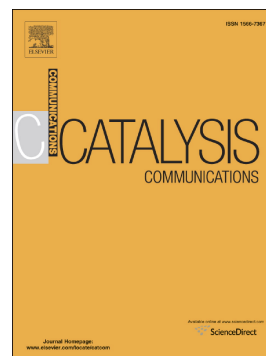


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Synthesis and characterization of magnetic  $\text{LiFe}_5\text{O}_8\text{-LiFeO}_2$  as a solid basic catalyst for biodiesel production

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## Abstract

This study is focused on the transesterification of the soybean oil into biodiesel using magnetic based solid catalysts ( $\text{LiFe}_5\text{O}_8\text{-LiFeO}_2$ ). The catalyst was prepared through a simple solid-state reaction that involved mixing and grinding iron oxide ( $\text{Fe}_2\text{O}_3$ ) and  $\text{Li}_2\text{CO}_3$ . The results demonstrated that the catalyst was ferromagnetic. Under the optimal reaction conditions, the highest FAME conversion in the transesterification of soybean oil can reach 96.5% by using  $\text{LiFe}_5\text{O}_8\text{-LiFeO}_2$  catalyst. The  $\text{LiFe}_5\text{O}_8\text{-LiFeO}_2$  demonstrates excellent catalytic activities and it could be recovered by magnetic separation. The  $\text{LiFe}_5\text{O}_8\text{-LiFeO}_2$  can be easily recovered and reused without significant deactivation.

**Keywords:** Magnetic catalyst,  $\text{LiFe}_5\text{O}_8\text{-LiFeO}_2$ , solid-state reaction, soybean oil, transesterification, biodiesel

## 1. Introduction

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