

## Biodiesel production from rice bran oil over modified natural zeolite catalyst

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### Abstrak

The purpose of this study is to develop natural zeolite impregnated with potassium nitrate (KNO<sub>3</sub>) as a heterogenous catalyst for the transesterification of rice bran oil (RBO) in order to produce Fatty Acid Methyl Ester (FAME). We conducted the Nitrogen adsorption-desorption method, Fourier Transform Infra-Red (FT-IR) spectrometer, and X-Ray Diffraction (XRD) analysis in order to characterize the physicochemical properties of the modified natural zeolite catalysts. We investigated the influences of RBO to methanol mole ratio in the range of 1:6 to 1:12. The variation of natural zeolite catalyst amount performed, also, at 1, 2.5, 5 and 10 wt. % of RBO. Moreover, the reaction temperatures were varied at room temperature (32°C), 60°C and 67.5°C. The highest biodiesel yield was 83.2% which was obtained at a ratio of 1:12 RBO to methanol mole, an amount of modified natural zeolite catalyst of 10 wt.% of RBO and a reaction temperature of 67.5°C. In order to study the reusability of modified natural zeolite catalyst, three successive transesterification reactions were carried out using the same reaction conditions.