OPTIMIZATION OF BIODIESEL PRODUCTION FROM *Reutealis trisperma* OIL USING NaOH AS CATALYST

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ABSTRACT

In this study, production of biodiesel from *Reutealis trisperma* oil using NaOH as catalyst was investigated. *Reutealis trisperma* oil is an attractive raw material for production of biodiesel. Biodiesel was produced by two steps of reactions, i.e. esterification and transesterification, using H$_2$SO$_4$ and NaOH as catalyst, respectively. Esterification reaction was carried out with methanol for 2 h, ratio methanol:oil (1:3). Transesterification reaction was carried out for 1 h with variation of catalyst concentration (0.5; 1.0; 1.5; 2.0 wt%), ratio methanol:oil (1:1, 1:2, 1:3 (wt/wt)) and temperature (30, 50, 65, 70°C). The reaction conditions with optimum yield was obtained at 65°C, ratio methanol: oil 1:1 (wt/wt) and catalyst concentration of 1.0 wt% NaOH. Kemiri sunan oil-based biodiesel had a range of acid numbers: 0.41-0.55 mg KOH/g, cetane numbers: 59-63, carbon residue: 0.13-0.28 %wt/wt, density: 0.89-0.90 g/cm$^3$ and viscosity: 6.98-9.33 cSt. The results were compared with biodiesel standard of ASTM D6751 and SNI 04-7182.

*Keywords:* *Reutealis trisperma* oil, biodiesel, transesterification, yield.
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