

ABSTRAK
PENINGKATAN SELEKTIVITAS GREEN DIESEL MELALUI PROSES
***HYDROTREATING* MINYAK JELANTAH DENGAN ETANOL SEBAGAI**
DONOR HIDROGEN

Green diesel merupakan bahan bakar nabati yang diproduksi melalui proses hydrotreating minyak jelantah menggunakan katalis NiMo/ γ -Al₂O₃. Penelitian ini bertujuan untuk mengevaluasi pengaruh variasi donor hidrogen (H₂ murni dan etanol) serta suhu reaksi (340–460 °C) terhadap karakteristik green diesel. Proses dilakukan dengan catalytic hydrotreating pada konsentrasi etanol 5%, 10%, dan 15%, sedangkan H₂ murni digunakan sebagai donor eksternal. Analisis produk meliputi viskositas, densitas, titik nyala, dan selektivitas fraksi hidrokarbon (C15–C18). Hasil menunjukkan bahwa H₂ murni menghasilkan selektivitas fraksi C15–C18 sebesar 27,78%, sedangkan etanol sebesar 23,55%. Karakteristik fisik green diesel memenuhi standar SNI 7182:2015, dengan viskositas 2,3–6,0 mm²/s, densitas 850–890 kg/m³, dan titik nyala ≥ 55 °C. Green diesel dari minyak jelantah berpotensi sebagai bahan bakar alternatif ramah lingkungan dengan kualitas sesuai standar nasional.

Kata Kunci: Green diesel, hydrotreating, minyak jelantah, %Selektivitas donor hidrogen

ABSTRACT

**INCREASING GREEN DIESEL SELECTIVITY THROUGH
HYDROTREATMENT OF USED COOKING OIL WITH ETHANOL AS A
HYDROGEN DONOR**

Green diesel is one of the biofuels produced through the hydrotreating process of used cooking oil using NiMo/ γ -Al₂O₃ catalyst. This study aims to investigate the effect of hydrogen donors (pure H₂ and ethanol) and reaction temperature (340–460 °C) on the characteristics of the resulting green diesel. The method employed catalytic hydrotreating with ethanol concentrations (5%, 10%, 15%) as in-situ hydrogen donors, while pure H₂ was used as an external hydrogen donor. Product analysis included viscosity, density, flash point, and hydrocarbon fraction selectivity (C15–C18). The results showed that pure H₂ yielded a higher C15–C18 fraction selectivity of 27.78% compared to ethanol at 23.55%. The physical properties of green diesel complied with SNI 7182:2015, with viscosity ranging from 2.3–6.0 mm²/s and density of 850–890 kg/m³. The highest flash point was recorded at 83 °C at 340 °C with 10% ethanol concentration. A decrease in flash point was observed at higher temperatures due to the formation of short-chain hydrocarbon fractions with higher volatility. These findings indicate that green diesel derived from used cooking oil has potential as an environmentally friendly alternative fuel that meets national quality standards.

Keywords: *Green diesel, hydrotreating, used cooking oil, NiMo/ γ -Al₂O₃, hydrogen donor*