

Synthesis of renewable diesel from palm oil and jatropha curcas oil through hydrodeoxygenation using nimo/zal

Bambang Heru Susanto, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920530861&lokasi=lokal>

Abstrak

Hydrodeoxygenation of palm oil and *Jatropha curcas* oil over NiMo/ZAL (nickel molybdenum/zeolit alam Lampung) catalyst was investigated under temperatures of 375°C and 400°C and H₂ pressure of 15 bar in a semibatch stirred autoclave reactor. NiMo/ZAL catalyst was prepared using a rapid cooling method. NiMo/ZAL characterization revealed a crystal size of 70.07 nm, surface area of 12.25 m²/g, and pore size and pore volume of 9.83 Å and 0.0062 cm³/g, respectively. The hydrodeoxygenation removal pathway of palm oil and *Jatropha curcas* oil over NiMo/ZAL catalyst was primarily achieved through decarboxylation. Under hydrogen pressure of 15 bar and temperature of 375°C, palm oil and *Jatropha curcas* oil can be converted into paraffin chains (from n-C15 up to n-C18) by a decarboxylation reaction that produces water, methane, and CO_x gases as byproducts and contains some undesirable reactions. These byproducts can produce alkene bonds that form chains different from those in conventional diesel fuel. The conversion was 80.87%, selectivity was 52.78%, and yield was 45.66%. The hydrodeoxygenation reaction catalyzed by NiMo/ZAL catalyst was found to be suitable for removing oxygen and producing paraffin chains; this increased the heating value and stability of renewable diesel fuel.