Triglyceride Hydroconversion into Biojet Fuel

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In the present work, various parameters in the catalytic hydroconversion of triglycerides were investigated for maximizing the production of biojet fuel. The results demonstrated that the two-step reaction process composed of separate hydrotreating and hydrocracking steps is markedly more advantageous than the single-step direct hydroconversion in terms of high biojet fuel yield, suppressed production of aromatic compounds, and catalyst lifetime. In the two-step reaction process, the diffusion characteristics of the multibranched hydrocarbon in the hydrocracking catalysts could be correlated with the yields of the jet fuel-range C_8-C_{16} hydrocarbons and the *iso*/*n*-paraffin ratios. The result indicates that the facile diffusion of multibranched isomers out of catalysts before excessive cracking is important for the suppression of the formation of light hydrocrabons. Consequently, Pt supported on nanocrystalline large-pore BEA zeolite with facile molecular diffusion characteristics produced the highest biojet fuel yield under the optimized operating conditions (55 wt% of palm oil after final distillation) as a result of suppressed overcracking.