Sintesis green diesel melalui perengkahan katalitik termal dari minyak jarak kepyar dengan katalis CaO = Synthesis of green diesel through catalytic thermal cracking reaction of castor oil with CaO catalyst

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Abstrak

Green diesel disintesis melalui perengkahan katalitik termal dengan katalis CaO dan bahan baku minyak jarak kepyar. Variasi pengujian yang dilakukan berupa suhu operasi (370 oC dan 400°C), berat katalis CaO (2 wt% dan 4 wt%), dan dengan ada atau tidaknya penambahan gas nitrogen. Sampel terbaik dimiliki oleh kondisi operasi 400°C, 2 wt%, dan tanpa penggunaan gas nitrogen, dengan hasil konversi sebesar 44,63% dan yield sebesar 55,01%, dan memenuhi 4 standar pengujian (densitas, viskositas, bilangan iodin, bilangan asam) yang sesuai dengan SNI 8220:2017. Namun, pengujian komposisi dan gugus fungsi dari sampel ini tidak menghasilkan fraksi karbon pada rentang C12 hingga C18. Hal ini membuka peluang baru pada industri, kosmetik, obat-obatan, dan sebagainya yang dihasilkan dari renewable product berupa heptaldehyde dan undeclyenic acid, dengan besar , dengan besar yield sebesar 31,09% dan 7,41%.

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Green diesel is synthesized through thermal catalytic cracking with CaO catalyst and castor oil (raw material). Variations of the tests carried out were operating temperature (370°C and 400°C), weight of CaO catalyst (2% and 4% by feed weight), and the presence or absence of nitrogen gas addition. The best sample is owned by operating conditions of 400 oC, 2% by weight of catalyst, and without the use of nitrogen gas, with conversion results of 44.63% and yield of 55.01%, and meets 4 test standards (density, viscosity, iodine number, acid number) in accordance with SNI 8220:2017. However, testing the composition and functional groups of this sample did not produce carbon fractions in the C12 to C18 range. This opens up new opportunities in the industry, cosmetics, medicine, etc., which are produced from renewable products in the form of heptaldehyde and undeclyenic acid, with large yields of 31.09% and 7.41%, respectively.