



PEMBUATAN KATALIS Mn/KARBON AKTIF UNTUK KONVERSI 1-BUTANOL MENJADI 1,1-DIBUTOKSIBUTANA

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INTISARI

Telah dilakukan pembuatan katalis Mn/karbon aktif sebagai katalis dehidrasi senyawa 1-butanol menjadi 1,1-dibutoksibutana. Sintesis katalis dilakukan melalui karbonisasi tempurung kelapa, selanjutnya kalsinasi karbon tempurung kelapa, kemudian impregnasi senyawa garam Mn asetat dalam karbon aktif, kemudian direduksi menggunakan gas H_2 . Desain eksperimen untuk dehidrasi katalitik senyawa 1-butanol menjadi senyawa 1,1-dibutoksibutana menggunakan desain eksperimen Taguchi. Kandungan logam pengotor Na, Ca, Fe dalam karbon aktif dan logam impregnan Mn dalam katalis dianalisis menggunakan spektrometri serapan atom. Keasaman karbon aktif dan katalis dianalisis menggunakan gravimetri serapan uap ammoniak. Produk senyawa 1,1-dibutoksibutana dianalisis kuantitatif menggunakan kromatografi gas.

Hasil penelitian menunjukkan bahwa kadar logam pengotor Na, Ca, Fe dalam karbon aktif dan logam impregnan Mn dalam katalis masing-masing 0,69; 2,57; 1,25; dan 3,83 $\mu\text{g/mL}$. Keasaman karbon aktif dan katalis masing-masing 2,49 dan 9,24 mmol/g. Produk tertinggi dehidrasi 1-butanol menjadi 1,1-dibutoksibutana berdasarkan analisis kuantitatif kromatografi gas sebesar 58,56%, pada parameter massa katalis 15 g, temperatur dehidrasi 500 °C, dan laju uap 1-butanol 0,20 mL/menit.

Kata kunci : karbon aktif, katalis Mn/karbon aktif, desain eksperimen Taguchi, 1-butanol, 1,1-dibutoksibutana



SYNTHESIS OF Mn/ACTIVATED CARBON CATALYST FOR CONVERSION OF 1-BUTANOL TO 1,1-DIBUTOXYBUTANE

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ABSTRACT

The objective of this research was synthesis of Mn/activated carbon catalyst as dehydration catalyst of 1-butanol to 1,1-dibutoxybutane compound. Synthesis of catalyst had been carried out by carbonization of coconut shell, then calcination of coconut shell carbon, then impregnation of Mn acetate salt in the activated carbon, then reduced by H₂ gas. Experiment design to dehydration of catalytic 1-butanol to 1,1-dibutoxybutane compound used design of experiment Taguchi's. Content of dirtier metals Na, Ca, Fe in the activated carbon and impregnant metal Mn in the catalyst was analyzed by Atomic Absorption Spectrometry (AAS). Acidity of the activated carbon and catalyst was analyzed by gravimetry of NH₃ vapor absorption. Product of 1,1-dibutoxybutane compound was quantitative analyzed by Gas Chromatography (GC).

The result of this research showed that content of dirtier metals Na, Ca, Fe in the activated carbon were 0.69, 2.57, 1.25 ppm, and impregnant metal Mn in the catalyst was 3.83 µg/mL. Acidity of the activated carbon and catalyst was 2.49 and 9.24 mmol/g. Based on the GC quantitative analysis, the highest percentage of 1,1-dibutoxybutane compound produced in this research was 58.56%. This percentage was produced at mass of catalyst 15 g, temperature of dehydration 500 °C, and vapor rate of 1-butanol 0.20 mL/minute.

Keywords : activated carbon, Mn/activated carbon, catalyst, design of experiment Taguchi's, 1-butanol, 1,1-dibutoxybutane



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