

**OPTIMASI KONVERSI ISOBUTANOL MENJADI
1,1-DIISOBUTOKSIISOBUTANA DENGAN KATALIS Cu/KARBON
AKTIF DIALIRI GAS H₂**

Anggit Wicaksono
14/364415/PA/15985

INTISARI

Optimasi konversi isobutanol menjadi 1,1-diiisobutoksiisobutana dengan katalis Cu/karbon aktif dialiri gas H₂ telah dilakukan. Tujuan penelitian ini adalah untuk mengetahui nilai keasaman karbon aktif dan katalis Cu/karbon aktif, optimum massa katalis, suhu, laju alir gas H₂ serta mengetahui persentase konversi 1,1-diiisobutoksiisobutana.

Penelitian dimulai dengan pembuatan karbon dari tempurung kelapa melalui karbonisasi pada suhu 500 °C selama 6 jam kemudian digerus 60-80 mesh dan diaktivasi pada suhu 850 °C menggunakan gas CO₂ dengan laju alir 15 mL menit⁻¹ selama 4 jam. Karbon aktif kemudian dicuci dengan aseton dan HCl 1,0 M sebanyak tiga kali. Logam tembaga diembankan pada karbon aktif dengan metode impregnasi basah, kemudian direduksi pada suhu 400 °C dengan dialiri gas H₂ dengan laju alir 15 mL menit⁻¹ selama 3 jam. Katalis diuji nilai keasamannya dengan metode adsorpsi amonia. Proses konversi isobutanol menjadi 1,1-diiisobutoksiisobutana dilakukan pada variasi massa katalis, suhu, dan laju alir gas H₂. Kondisi optimum tiap variasi konversi diperoleh menggunakan metode Taguchi. Karbon aktif serta katalis Cu/KA dianalisis dengan FTIR, SEM, XRD, ICP, AAS, dan ¹H-NMR dan ¹³C-NMR. Produk konversi dianalisis menggunakan GC, dan GC-MS.

Konversi isobutanol menjadi 1,1-diiisobutoksiisobutana dengan katalis Cu/KA optimum pada massa katalis 15 g, suhu 500 °C dan laju alir gas H₂ 15 mL menit⁻¹. Persentase konversi 1,1-diiisobutoksiisobutana yang diperoleh pada kondisi optimum sebesar 49,45%.

Kata kunci: 1,1-diiisobutoksiisobutana, karbon aktif, katalis Cu/karbon aktif, konversi, metode Taguchi

**OPTIMIZATION CONVERSION OF ISOBUTANOL INTO
1,1-DIISOBUTOXYISOBUTANE WITH Cu/ACTIVATED CARBON
CATALYST FLOWED BY H₂ GAS**

Anggit Wicaksono
14/364415/PA/15985

ABSTRACT

Optimization conversion of isobutanol into 1,1-diisobutoxyisobutane with catalyst of Cu/activated carbon flowed by H₂ gas has been conducted. The purposes of this research were to determine activated carbon and Cu/activated carbon catalyst acidity value, optimum of catalyst mass, temperature, H₂ gas flow rate and to know the conversion percentage of 1,1-diisobutoxyisobutane.

The research began with preparing the carbon from coconut shells through the carbonization process at a temperature of 500 °C for 6 hours then crashed 60-80 mesh and activated at 850 °C under CO₂ gas with flow at 15 mL min⁻¹ for 4 hours. The activated carbon was washed by acetone and HCl 1.0 M three times. Metal copper was impregnated on activated carbon by wet impregnation method, then reduced at 400 °C and flowed by H₂ gas with flow 15 mL min⁻¹ for 3 hours. Ammonia adsorption method was used for determining the catalyst acidity value. The conversion of isobutanol into 1,1-diisobutoxyisobutane was carried out at variation of catalyst mass, temperature, and H₂ gas flow rate. The optimum conversion variation was obtained by Taguchi method. Activated carbon and Cu/AK catalyst was analyzed using FTIR, SEM, XRD, ICP, AAS, ¹H-NMR and ¹³C-NMR. Conversion product analyzed using GC and GC-MS.

The optimum conversion of isobutanol into 1,1-diisobutoxyisobutane was obtained at catalyst mass 15 g, temperature 500 °C, and the H₂ gas flow rate 15 mL min⁻¹. The conversion percentage of 1,1-diisobutoxyisobutane at the optimum condition was 49.45%.

Keywords: 1,1-diisobutoxyisobutane, activated carbon, Cu/activated carbon, conversion, Taguchi method