

Produksi dimethyl ether secara langsung dari gas sintesis menggunakan katalis Cu-ZnO-Al₂O₃ ZSM-5 = Production of dimethyl ether with direct synthesis method with Cu- ZnO- Al₂O₃ ZMS-5 catalyst

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Abstrak

[Bahan LPG berbasis gas alam masih dominan sebagai bahan bakar yang digunakan masyarakat, dimana pada masa yang akan datang kebutuhan masyarakat akan mengalami peningkatan dengan kemajuan industri. Pada penelitian ini telah dibuat suatu bakar alternatif sebagai substitusi LPG dengan menggunakan dimetil eter (DME). Produksi DME melalui proses langsung dari gasifikasi batubara dan biomassa. Reaksi dilakukan di dalam reaktor unggun diam dengan katalis Cu-ZnO-Al₂O₃/ZSM-5. Tekanan yang digunakan adalah 20 bar. Variabel bebas yang digunakan yaitu variasi temperatur pada 250°C, 270°C, 280°C dan rasio gas sintesis (H₂/CO) untuk biomassa (H₂/CO)=0,5 dan batubara (H₂/CO)=2. Hasil produk terbesar yang didapatkan pada kondisi temperatur 270°C dan rasio H₂/CO=2 didapatkan yield sebesar 83%, analisa DME yang telah dihasilkan menggunakan gas kromatografi dengan jenis TCD dan FID untuk mengetahui hasil reaksi dari sintesis DME langsung.;Materials of natural gas-based LPG is still the dominant fuel used seagai society, where the future needs of the community will increase with the progress of industry. This research will make an alternative fuel as a substitute for LPG by using dimethyl ether (DME). DME production through the direct process of gasification of coal and biomass. The reaction carried out in the fixed bed reactor with catalyst Cu-ZnO-Al₂O₃/ZSM-5. The pressure used was 20 bar. The independent variables used were variations of temperature at 250 °C, 270°C, 280°C and the ratio of synthesis gas (H₂/CO) for biomass (H₂/CO) = 0.5 and coal (H₂/CO) = 2. The results of the largest product obtained under conditions of temperature 270 °C and the ratio H₂/CO = 2 obtained a yield of 83%, which has resulted DME analysis using gas chromatography with TCD and FID types to determine the reaction of the direct synthesis of DME., Materials of natural gas-based LPG is still the dominant fuel used seagai society, where the future needs of the community will increase with the progress of industry. This research will make an alternative fuel as a substitute for LPG by using dimethyl ether (DME). DME production through the direct process of gasification of coal and biomass. The reaction carried out in the fixed bed reactor with catalyst Cu-ZnO-Al₂O₃/ZSM-5. The pressure used was 20 bar. The independent variables used were variations of temperature at 250 °C, 270°C, 280°C and the ratio of synthesis gas (H₂/CO) for biomass (H₂/CO) = 0.5 and coal (H₂/CO) = 2. The results of the largest product obtained under conditions of temperature 270 °C and the ratio H₂/CO = 2 obtained a yield of 83%, which has resulted DME analysis using gas chromatography with TCD and FID types to determine the reaction of the direct synthesis of DME.]