Reaksi Konversi Katalitik Aseton Menjadi Hidrokarbon Aromatik Menggunakan Katalis H-ZSM-5

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Abstrak

Senyawa aseton dapat dipandang sebagai salah satu model senyawa organik turunan biomasa (renewable material). Senyawa aseton telah dapat dikonversi menjadi hidrokarbon aromatik menggunakan katalis H-ZSM-5 dengan variasi rasio Si/Al (25, 75 dan 100) menggunakan fixed bed reactor bertekanan atmosferik pada suhu diatas 350 oC. Didapatkan bahwa ketiga rasio H-ZSM-5 memiliki kemampuan shape selectivity yang tinggi untuk senyawa aromatik (yield >70%). Perbedaan kinerja katalis terlihat setelah 2 jam reaksi, katalis rasio Si/Al=75 dan 100 lebih rentan mengalami deaktivasi. Sedangkan, ZSM-5 rasio Si/Al=25 masih bertahan dengan konversi 100% & yield diatas 70%. Terbentuknya kokas menyebabkan penurunan keasaman katalis dan luas permukaannya.

.....Acetone is a organic polar compound which can be produced renewably from biomass through a fermentation process or by catalytic process of a biomassderived liquid. The prospective and sustainable system from a new schematic route can be established, if this product could be transformed into hydrocarbons. That?s why this research is intended to develop a catalytic process for aromatic production from acetone using ZSM-5.Organic acetone could be transformed into aromatic by catalytic reaction using ZSM-5 in fixed-bed reactor at atmospheric. HZSM-5 with Si/Al = 25 was more active and stable than that of Si/Al ratio 75 or 100. The yield of aromatic was obtained higher than 70 wt %. It indicates that the reaction of acetone requires a high acid density and H-ZSM-5 is shape selective catalyst for the aromatic formation due to pore opening (0,56 nm) is very close to the geometrical molecular size of the aromatic. The deactivation by coking caused the decreasing the area surface and the acidity of catalyst.