

Performance comparison of microporous and mesoporous catalysts on catalytic upgrading of furfural

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In the world, recently increasing environmental concerns and depleting petroleum sources have been the stimulus for renewable energy research to produce alternative energies. Differing from conventional fossil fuels, lignocellulosic biomass to produce bio-oil seems to be a highly potential renewable source, because of its low cost and availability. The bio-oil from pyrolysis of biomass has high content of oxygen, more acidic compounds and low heating value. Thus, it needs the upgrading of bio-oil to get high-quality bio-oil with low oxygen content. In this study, we compared the product distribution from catalytic upgrading of furfural with commercial microporous (as example; ZSM-5) and mesoporous (as example; γ -alumina) catalysts. The experiments were conducted in a continuous plug flow reactor during 20 minutes, catalyst amount of 2 gram under atmosphere pressure at 500°C. The conversion of furfural to furan, mono-rings, PAHs in main liquid products, and olefins, CO, CO₂ in gas products, and coke amount was clearly differed for both microporous and mesoporous catalysts.