

Effect of Si/Al ratio on metal/ZSM-5 catalyst for catalytic upgrading of bio-oil

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Biomass-derived fuels are receiving promising alternative energy because of increasing environmental concerns and depleting petroleum sources. Differing from conventional fossil fuels, lignocellulosic biomass to produce bio-oil seems to be a highly potential renewable source, due to its low cost and CO<sub>2</sub> neutral balance. The bio-oil from pyrolysis of biomass has high content of oxygen, more acidic compounds and low heating value. Therefore, it needs the upgrading of bio-oil to obtain high-quality bio-oil with low oxygen content. In this study, we compared the product distribution from catalytic upgrading of bio-oil using metal-modified ZSM-5 zeolite 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 product composition, and acids, phenols, mono-rings, PAHs in main liquid products, and olefins, CO, CO<sub>2</sub> in gas products, and coke amount was clearly differed for commercial ZSM-5 and metal-doped ZSM-5 catalysts.