

The catalytic upgrading pyrolysis of lignocellulose in the presence of Mg/ZSM-5

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The catalytic upgrading pyrolysis of waste wood was performed with the Mg/ZSM-5. The catalysts were prepared by a wet incipient method. The aim of this study was to improve the quality of bio-oil by enhancing hydrocarbons and decreasing oxygenated compounds compared with the bio-oil derived from a non-catalytic condition. The used catalysts were parent ZSM-5, 1.5, 3 wt % Mg/ZSM-5. From the result of GC/MS, the bio-oil has low Acids, Aldehydes, and Ketones with higher Hydrocarbons than before catalyst. The parent ZSM-5 with 3 wt % magnesium produced various hydrocarbons that were not showed before. The interaction between parent ZSM-5 and magnesium has a synergy effect on an aromatization. The prepared catalysts were measured by XRD, BET surface area, ICP-OES, and NH₃-TPD to investigate the physicochemical properties, indicating non-changed crystal structure and the amount of the Bronsted acid site higher than before. As the conclusion, the prepared catalyst can increase desirable compounds from 0 % to 14 % as well as decrease oxygenated compounds from 40 % to 24 % since it has increased bronsted acid site inside that can reject oxygen in bio-oil more than before.