

Effect of biomass types on bio-oil characteristics in a catalytic fast pyrolysis process with a ni/zsm-5 catalyst

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Abstrak

The application of bio-oil for biofuel has been limited due to its low heating value, high acidity and high oxygenate content. pursuant to the urgency of obtaining access to sustainable energy from renewable resources, the studies for bio-oil upgrading have been recently placed in high priority. this study is aimed at identifying the effect of biomass types on bio-oil product characteristics. the conversion of several types of biomass, i.e. rice straw, rubberwood (*hevea brasiliensis*), and palm empty fruit bunches (efb) to bio-oil by-products was investigated in a catalytic fast pyrolysis (cfp) reactor using a ni/zsm-5 nickel nitrate and zeolite catalyst at 550oc and at atmospheric pressure. the results show that ni/zsm-5 catalyst has actively enhanced the de-oxygenation reaction process and aromatic production. the composition of aromatic compounds in bio-oil from rubberwood, rice straw, and efb are 10.25 wt%, 7.8 wt%, and 5.98 wt%, respectively. in the absence of a catalyst, bio-oil from rice straw contains no aromatics.