Green aromatics from biomass fast pyrolysis and catalysis

Abstract

The green synthesis of aromatic chemicals is especially important due to their high volume in making fuels and chemicals. Biomass pyrolysis integrated with catalysis provides one renewable route for creating these aromatics like benzene, toluene and xylenes. To this end, several biomass types and catalyst preparations were examined for yield performance using analytical pyrolysis–GC/MS. In addition, MSU-MFI, a mesoporous zeolite with intracrystal mesopores, was synthesized using silane-modified polymers as mesopore-generating agents. Due to higher yields and lower coke formation when compared with the conventional ZSM-5 catalyst, MSU-MFI offers an improved option for making non-oxygenated aromatic chemicals from photosynthetic biomass. Biomass fast pyrolysis was also demonstrated on a pilot-scale using a compact, transportable, screw conveyor reactor for producing bio-oil.

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