Green aromatics from catalytic fast pyrolysis of fast growing Meranti biomass

abstract

The study on catalytic pyrolysis decomposition of Shorea leprosula wood biomass to form aromatic compounds in fast pyrolysis was performed by pyrolytic-gas chromatography/mass spectroscopy (Py-GC/MS) and transmission electron microscope (TEM) – electron energy-loss spectroscopy (EELS) to analyze the chemical compound and solid residue microstructure. Py-GC/MS and TEM-EELS analysis showed that the fast pyrolysis increased the decomposition of hardwood, in which in the presence of ZSM-5 catalyst, the liquid products from wood decomposition was then diffused into the pore of ZSM-5 catalyst to form aromatics including benzene, toluene, styrene, naphthalenes and indanes. The carbonaceous solid compounds or cokes were not deposited on the surface of pores of ZSM-5 catalyst in the fast pyrolysis, as shown by the EELS spectrum that exhibited no detection of any solid carbonaceous compound in the solid residue.