

Pretreatment of empty palm fruit bunch for production of chemicals via catalytic pyrolysis

Abstract

The effect of chemical pretreatments using NaOH, H₂O₂, and Ca(OH)₂ on Empty Palm Fruit Bunches (EPFB) to degrade EPFB lignin before pyrolysis was investigated. Spectrophotometer analysis proved consecutive addition of NaOH and H₂O₂ decomposed almost 100% of EPFB lignin compared to 44% for the Ca(OH)₂, H₂O₂ system while NaOH and Ca(OH)₂ used exclusively could not alter lignin much. Next, the pretreated EPFB was catalytically pyrolyzed. Experimental results indicated the phenolic yields over Al-MCM-41 and HZSM-5 catalysts were 90 wt% and 80 wt%, respectively compared to 67 wt% yield for the untreated sample under the same set of conditions. Meanwhile, the experiments with HY zeolite yielded 70 wt% phenols.