

Lignin Liquefaction in Supercritical Ethanol and Subcritical Water in The Presence of Base Catalysts

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Liquefaction of hydrolysis lignin (HL) was performed at 350°C in stirrer batch reactor, with and without addition of homogenous base catalyst (KOH, NaOH, and K₂CO₃) involving supercritical ethanol (Sc ethanol) or subcritical water as a solvent. The effect of base catalysts toward the conversion and the number of liquid product constituents were investigated in this research. The positive effects of strong base catalysts were observed when liquefaction employed Sc ethanol, on the contrary the negative effects were observed in case of liquefaction in subcritical water. In HL liquefaction involving Sc ethanol, the presence of base catalyst gave higher heavy oil (HO) yield but the trade off is the increasing of solid residue (SR) by depressing gas formation. The highest conversion (70%-w) was achieved when using KOH, while the highest amount of HO yield (64%-w) was obtained when NaOH was introduced. Phenolic compounds, such as methoxy phenol (mequinol), ethyl methoxy phenol, and trimethoxy phenol were obviously detected in HO.