

Liquefaction of sawdust over KOH in supercritical ethanol

이인구[†], 박성준

한국에너지기술연구원

(samwe04@kier.re.kr[†])

Low energy density of lignocellulosic biomass limits its utilization as a fuel in industry and urban areas. Conversion of solid-phase biomass resources to liquid-phase fuels can significantly increase its energy density. Representative methods include fast pyrolysis and liquefaction. Liquefaction of lignocellulosic biomass such as sawdust in hot water has been widely studied to obtain oily products with high energy density. This method has been revealed to have some drawbacks like low oil yield and wastewater generation. In this study, we employed ethanol as a reaction medium instead of water for liquefaction of sawdust. The effect of reaction time and reaction temperature on the product distribution was investigated in batch reactors. The reactant consisted of 20 wt% sawdust and 80 wt% ethanol, As much as 5 g of KOH was used in every experiment. Single-phase liquid product with maximum yield of 83.6 wt% was obtained at 300 °C, 250bar, and 40 min holding time. GC-MS analysis of the liquid products showed phenolics, oxygenates, and aromatic compounds to be major products. The increase in reaction temperature from 150 to 300 °C enhanced the yield of liquid products.