

Reaction characteristics of hydrogenation with reaction condition in direct liquefaction using the coal over Ni-based catalyst

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Direct coal liquefaction is an efficient technology to produce liquefied hydrocarbon fuels with the combined cracking and hydrogenation of coal under high temperature and pressure. Direct coal liquefaction show low economics and reactivity and yield and so on. In this study, reaction characteristics of hydrogenation in liquefaction of coal over Ni-based catalyst was investigated to obtain the effect of the various reaction conditions. Coal liquefaction with hydrogenation are improved the quality and yield of the liquid products with small molecular weights produced from coal under mild conditions of pressure and temperature. And then the reaction conditions such as the temperature, pressure, the amount of catalyst and hydrogen and reaction time were varied for the hydrogenation of coal. Also, the physico-chemical properties of the coal and catalyst before and after the reaction were analyzed by gas chromatography-mass, x-ray diffraction, proximate analyzer, elemental analysis, FT-IR etc.