천연가스와 바이오매스로부터 개선된 DME 공정의 개발

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Development of Innovation DME Process from Natural Gas and Biomass in KOREA

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Hydrogen is an alternative fuel for the future energy which can reduce pollutants and greenhouse gases. Synthesis gas have played an important role of synthesizing the valuable chemical compound, for example methanol, DME and GTL chemicals. Renewable biomass feedstocks can be potentially used for fuels and chemical production. Current thermal processing techniques such as fast pyrolysis, slow pyrolysis, and gasification tend to generate products with a large slate of compounds. Lignocellulose feedstocks such as forest residues are promising for the production of bio-oil and synthesis gas. Pyrolysis and gasification was investigated using thermogravimetric analyzer (TGA) and bubbling fluidized bed gasification reactor to utilize forest woody biomass. Most of the materials decomposed between 320 ℃ and 380 ℃ at heating rates of 5~20 ℃/min in thermogravimetric analysis. Bubbling fluidized bed reactor were use to study gasification characteristics, and the effects of reaction temperature, residence time and feedstocks on gas yields and selectivities were investigated. With increasing temperature from 750 ℃ to 850 ℃, the yield of char decreased, whereas the yield of gas increased. The gaseous products consisted of mostly CO, CO2, H2 and a small fraction of C1-C4 hydrocarbons.

Key words : Dimethyl Ether(디메틸에테르), DME(디엠이), Biomass(바이오매스), Natural gas(천연가스), Synthesis gas(합성가스), Syngas(합성가스), CO2(이산화탄소), Woody biomass(목질계 바이오매스), Pyrolysis Gasification Facility(열분해 가스화 설비), Synthesis Gas(합성가스), Fluidized bed reactor(유동층 반응기), Thermal gravimetric analyzer(TGA, 열분석기), Char(촤)

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