

Liquid Fuel Production via Catalytic Pyrolysis of Waste Oil

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Abstract : Pyrolysis of waste oil is an effective process to produce high quality liquid fuels. In this work, pyrolysis experiments of waste oil over Y zeolite were carried out in a semi-batch reactor under a flow of nitrogen at atmospheric pressure and at different reaction temperatures (350-450 ^oC). The products were gas, liquid fuel, and residue. Only liquid fuel was further characterized for its composition and properties by using gas chromatography, thermogravimetric analyzer, and bomb calorimeter. Experimental results indicated that the pyrolysis reaction temperature significantly affected both yield and composition distribution of pyrolysis oil. An increase in reaction temperature resulted in increased fuel yield, especially gasoline fraction. To obtain high amount of fuel, the optimal reaction temperature should be higher than 350 ^oC. A presence of Y zeolite in the system enhanced the cracking activity. In addition, the pyrolysis oil yield is proportional to the catalyst quantity.

Keywords : gasoline, diesel, pyrolysis, waste oil, Y zeolite

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