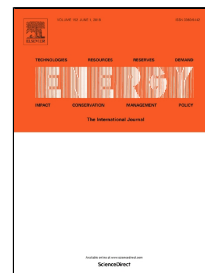


Accepted Manuscript

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PII: S0360-5442(18)31026-0
DOI: 10.1016/j.energy.2018.05.182
Reference: EGY 13017
To appear in: *Energy*
Received Date: 05 March 2018
Accepted Date: 27 May 2018

Please cite this article as: Ki-Bum Park, Seung-Jin Oh, Guzelciftci Begum, Joo-Sik Kim, Production of clean oil with low levels of chlorine and olefins in a continuous two-stage pyrolysis of a mixture of waste low-density polyethylene and polyvinyl chloride, *Energy* (2018), doi: 10.1016/j.energy.2018.05.182

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Production of clean oil with low levels of chlorine and olefins in a continuous two-stage pyrolysis of a mixture of waste low-density polyethylene and polyvinyl chloride

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Abstract

In this study, a continuous two-stage pyrolyzer consisting of an auger reactor and a fluidized bed reactor was applied to produce an oil with a low level of chlorine from a mixture of low density polyethylene and polyvinyl chloride waste. In the experiment, the auger reactor operated at 300–400 °C, thus releasing HCl prior to the main pyrolysis in the fluidized bed reactor. The auger reactor also played a role in elevating vibrational modes of molecules to promote the production of ethene, propene, and 1,3-butadiene. The yields of those monomers totaled 29 wt.%. Pyrolysis oils obtained from the fluidized bed reactor were enriched with aromatics up to 95 wt.%. Together with the two-stage pyrolyzer and a lime hot filter, a pyrolysis oil having only 9.25 ppm chlorine could be obtained. This value is the lowest ever reported. This study showed that a two-stage pyrolyzer together with a lime hot filter could produce a

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