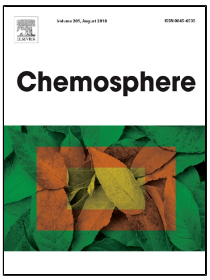
Accepted Manuscript



Products derived from waste plastics (PC, HIPS, ABS, PP and PA6) via hydrothermal treatment: Characterization and potential applications

Xuyuan Zhao, Lu Zhan, Bing Xie, Bin Gao

PII:	S0045-6535(18)31007-5
DOI:	10.1016/j.chemosphere.2018.05.156
Reference:	CHEM 21488
To appear in:	*Chemosphere*
Received Date:	11 November 2017
Accepted Date:	25 May 2018

Please cite this article as: Xuyuan Zhao, Lu Zhan, Bing Xie, Bin Gao, Products derived from waste plastics (PC, HIPS, ABS, PP and PA6) via hydrothermal treatment: Characterization and potential applications, *Chemosphere* (2018), doi: 10.1016/j.chemosphere.2018.05.156

Products derived from waste plastics (PC, HIPS, ABS, PP and PA6) via hydrothermal treatment: Characterization and potential applications

Xuyuan Zhao[a], Lu Zhan* [a,b], Bing Xie [a,b], Bin Gao[c]

a Shanghai Key Lab for Urban Ecological Processes and Eco-Restoration, School of Ecological and Environmental Sciences, East China Normal University, Shanghai 200241, China

b Shanghai Institute of Pollution Control and Ecological Security, 1515 North Zhongshan Road, Shanghai 200092, China

c Department of Agricultural and Biological Engineering, University of Florida, Gainesville, FL 32611, USA

Abstract

In this study, hydrothermal method was applied for the treatment of five typical waste plastics (PC, HIPS, ABS, PP and PA6). The hydrothermal products of oils and solid residues were analyzed for the product slate and combustion behaviors. Some predominant chemical feedstock were detected in the oils, such as phenolic compounds and bisphenol A (BPA) in PC oils, single-ringed aromatic compounds and diphenyl-sketetons compounds in HIPS and ABS oils, alkanes in PP oils, and caprolactam (CPL) in PA6 oils. The hydrothermal solid residues were subjected to DSC analysis. Except the solid residues of PA6, all the solid residues had enormous improvement on the enthalpy of combustion. The solid residues of PC had the maximum promotion up to 576.03% compared to the raw material. The hydrothermal treatment significantly improved the energy density and facilitated effective

Corresponding author phone: +86 21 54341064; fax: +86 21 54341064; e-mail: lzhan@des.ecnu.edu.cn