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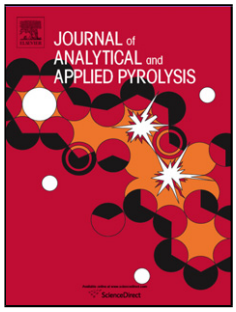

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Authors: Quan Bu, Yuanyuan Liu, Jianghui Liang, Hervan Marion Morgan Jr., Lishi Yan, Fuqing Xu, Hanping Mao

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Microwave-assisted co-pyrolysis of microwave torrefied biomass with waste plastics using ZSM-5 as a catalyst for high quality bio-oil

Quan Bu[a], Yuanyuan, Liu[a], Jianghui Liang[a], Hervan Marion Morgan Jr. [a], Lishi Yan[b], Fuqing Xu[c], Hanping Mao[a,*]

[a]*School of Agricultural Equipment Engineering, Jiangsu University, 301 Xuefu Road, Zhenjiang, Jiangsu Province 212013, P.R.China*

[b]*School of Chemical Biology and Materials Engineering, Suzhou University of Science and Technology, Suzhou 215009, PR China*

[c]*Department of Food, Agricultural and Biological Engineering, The Ohio State University, Ohio Agricultural Research and Development Center, 1680 Madison Avenue, Wooster, OH 44691, USA*

**Corresponding author, Phone: +86-511-88797338, E-mail: maohp@ujs.edu.cn,*

Postal address: School of Agricultural Equipment Engineering, Jiangsu University, 301 Xuefu Road, Zhenjiang, Jiangsu Province 212013, P.R.China

Highlights:

- Biomass torrefied via microwave heating enhanced both the quantity and quality of bio-oil.
- Parameters optimization of catalytic microwave co-pyrolysis of biomass and LDPE for bio-oil.
- Temperature and catalyst dosage were key factors influencing both bio-oil yield and selectivity.
- The proportion of hydrocarbons was the highest (about 40%) in the bio-oils.

Abstract: This study aims to produce high quality bio-oil by microwave co-pyrolysis of torrefied biomass (rice straw) and low density polyethylene (LDPE) using ZSM-5 as a catalyst. A central composite experimental design was used to optimize the reaction condition by response surface methodology analysis. The effects of reaction temperatures and catalyst dosages on the product yield and chemical selectivity of bio-oil were investigated. Results