The Effects of Catalysts on the Conversion of Organic Matter and Bio-fuel Production in the Microwave Pyrolysis of Sludge at Different Temperatures

Rui Ma, Xiaofei Huang, Yang Zhou, Lin Fang, Shichang Sun, Peixin Zhang, Xianghua Zhang, Xuxin Zhao

PII: S0960-8524(17)30610-7
DOI: http://dx.doi.org/10.1016/j.biortech.2017.04.103
Reference: BITE 17998

To appear in: *Bioresource Technology*

Received Date: 28 February 2017
Revised Date: 24 April 2017
Accepted Date: 25 April 2017

Please cite this article as: Ma, R., Huang, X., Zhou, Y., Fang, L., Sun, S., Zhang, P., Zhang, X., Zhao, X., The Effects of Catalysts on the Conversion of Organic Matter and Bio-fuel Production in the Microwave Pyrolysis of Sludge at Different Temperatures, *Bioresource Technology* (2017), doi: http://dx.doi.org/10.1016/j.biortech.2017.04.103

The Effects of Catalysts on the Conversion of Organic Matter and Bio-fuel Production in the Microwave Pyrolysis of Sludge at Different Temperatures

Rui Ma[a,&], Xiaofei Huang[a], Yang Zhou[a], Lin Fang[a*]; Shichang Sun[a,b,&*]; Peixin Zhang[a]; Xianghua Zhang[c,d]; Xuxin Zhao[a]

&: Rui Ma and Shichang Sun contributed equally to this work.

a College of Chemistry and Environmental Engineering, Shenzhen University, Shenzhen, 518060, China;

b College of Optoelectronic Engineering, Shenzhen University, Shenzhen, 518060, China;

c College of Physics and Energy, Shenzhen University, Shenzhen, 518060, China;

d Laboratory of Glasses and Ceramics, Institute of Chemical Science, University of Rennes 1, Rennes 35042, France.

ABSTRACT: Adding catalyst could improve the yields and qualities of bio-gas and bio-oil, and realize the oriented production. [1]Results showed that the catalytic gas-production capacities of CaO were higher than those of Fe_2O_3, and the bio-gas yield at 800℃ reached a maximum of 35.1 %. Because the polar cracking active sites of CaO reduced the activation energy of the pyrolysis reaction and resulted in high catalytic cracking efficiencies. In addition, the quality of bio-oil produced by CaO was superior to that by Fe_2O_3, although the bio-oil yield of CaO was relatively weak. The light bio-fuel

[1] *Corresponding author: email: fanglinhit@163.com;

*Co-corresponding author: sunshichang@szu.edu.cn

Full postal address: No. 3688, Nanhai Road, Nanshan District, Shenzhen, China, 518060.