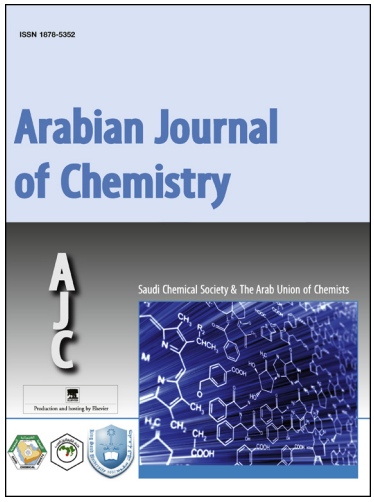

Variation of heavy metal speciation during the pyrolysis of sediment collected from Dianchi Lake, China

Zhenggang Gu, Min Wu, Kang Li, Ping Ning

PII: S1878-5352(13)00253-0
DOI: http://dx.doi.org/10.1016/j.arabjc.2013.07.053
Reference: ARABJC 1043

To appear in: *Arabian Journal of Chemistry*

Received Date: 27 May 2013
Accepted Date: 24 July 2013

Please cite this article as: Z. Gu, M. Wu, K. Li, P. Ning, Variation of heavy metal speciation during the pyrolysis of sediment collected from Dianchi Lake, China, *Arabian Journal of Chemistry* (2013), doi: http://dx.doi.org/10.1016/j.arabjc.2013.07.053

Variation of heavy metal speciation during the pyrolysis of sediment collected from Dianchi Lake, China

Zhenggang Gu [a], Min Wu [a], Kang Li [b], Ping Ning [a]*

[a] Faculty of Environmental Science & Engineering, Kunming University of Science & Technology, Kunming 650500, China.

[b] Zhejiang East Rainbow Environmental Protection Co., Ltd. Hangzhou, 310012, China

Abstract

Sediment samples with high organic carbon were collected from Dianchi Lake in China and thermally treated using a method analogous to biochar production. The speciation of the heavy metals Cu, Cd, Pb, and Zn in sediment and thermally treated sediments (TTSs) were analyzed by European Community Bureau of Reference (BCR) sequential extraction methods. Heavy metal bioavailability and eco-toxicity were assessed by risk assessment code. This study demonstrates that BCR sequential extraction methods and risk assessment code can be used as valuable tools to assess heavy metal mobility, bioavailability and eco-toxicity. Compared to biochar derived from biomass, TTSs had different characteristics, which may contribute to the formation of organo-mineral complexes. The heavy metals Cu, Cd, Pb, Zn speciated in TTSs show different patterns from that of sediment and pyrolysis temperature have a great influence on the fraction distribution of heavy metals. Those different distributions may attribute to the geochemistry of sediment and the different physicochemical characteristics of heavy metals. In order to safe application of thermally –treatment sediments (TTSs) as a soil amendment, further studies such as field experiments may be required.

*Corresponding author. Tel. / fax: +86 87165102829.
E-mail addresses: pingning58@gmail.com (P. Ning).