

Accepted Manuscript

Red mud enhances methanogenesis with the simultaneous improvement of hydrolysis-acidification and electrical conductivity

Jie Ye, Andong Hu, Guoping Ren, Ting Zhou, Guangming Zhang, Shungui Zhou

PII: S0960-8524(17)31368-8

DOI: <http://dx.doi.org/10.1016/j.biortech.2017.08.063>

Reference: BITE 18672

To appear in: *Bioresource Technology*

Received Date: 2 June 2017

Revised Date: 8 August 2017

Accepted Date: 9 August 2017



Please cite this article as: Ye, J., Hu, A., Ren, G., Zhou, T., Zhang, G., Zhou, S., Red mud enhances methanogenesis with the simultaneous improvement of hydrolysis-acidification and electrical conductivity, *Bioresource Technology* (2017), doi: <http://dx.doi.org/10.1016/j.biortech.2017.08.063>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Red mud enhances methanogenesis with the simultaneous improvement of hydrolysis-acidification and electrical conductivity

Jie Ye^a, Andong Hu^a, Guoping Ren^a, Ting Zhou^a, Guangming Zhang^b, Shungui Zhou^a,

*

^a Fujian Provincial Key Laboratory of Soil Environmental Health and Regulation, College of Resources and Environment, Fujian Agriculture and Forestry University, Fuzhou 350002, China

^b School of Environment & Natural Resource, Renmin University of China, 59 Zhongguancun Street, Beijing 100872, China

Abstract

The role of red mud in the improvement of methanogenesis during sludge anaerobic digestion was innovatively investigated in this study. The results demonstrated that the addition of 20 g/L red mud resulted in a 35.5% increase in methane accumulation. Red mud effectively promoted the hydrolysis-acidification of organic compounds in the sludge, which resulted in the increase of protein, polysaccharide, and VFAs by 5.1-94.5%. The activities of key enzymes were improved by 41.4-257.3%. Electrochemical measurements presented direct evidence that the electrical conductivity was significantly improved with red mud. More conductive magnetite was formed during the secondary mineralization after Fe(III) reduction by Fe (III)-reducing genes such as *Clostridiaceae* and *Ruminococcaceae*. The higher

Download English Version:

<https://daneshyari.com/en/article/4996632>

Download Persian Version:

<https://daneshyari.com/article/4996632>

[Daneshyari.com](https://daneshyari.com)