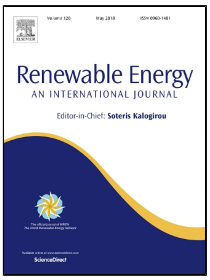
Accepted Manuscript



Microwave irradiation with dilute acid hydrolysis applied to enhance the Saccharification rate of water hyacinth (*Eichhornia crassipes*)

Yuan-Chung Lin, Sumarlin Shangdiar, Shang-Cyuan Chen, Feng-Chih Chou, Yu-Chieh Lin, Che-An Cho

PII:	S0960-1481(18)30265-9
DOI:	10.1016/j.renene.2018.02.113
Reference:	RENE 9844
To appear in:	*Renewable Energy*
Received Date:	02 June 2017
Revised Date:	25 December 2017
Accepted Date:	24 February 2018

Please cite this article as: Yuan-Chung Lin, Sumarlin Shangdiar, Shang-Cyuan Chen, Feng-Chih Chou, Yu-Chieh Lin, Che-An Cho, Microwave irradiation with dilute acid hydrolysis applied to enhance the Saccharification rate of water hyacinth (*Eichhornia crassipes*), *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.02.113

Microwave irradiation with dilute acid hydrolysis applied to enhance the Saccharification rate of water hyacinth (*Eichhornia crassipes*)

Yuan-Chung Lin [1, 2*], Sumarlin SHANGDIAR [1], Shang-Cyuan Chen[1], Feng-Chih Chou[1], Yu-Chieh Lin[1], Che-An Cho[1]

[1] Institute of Environmental Engineering, National Sun Yat-Sen University, Kaohsiung 804, Taiwan.

[2] Ph.D Program in Toxicology, College of Pharmacy, Kaohsiung Medical University, Kaohsiung 807, Taiwan.

Abstract

Sugar generated from aquatic plant biomass with high cellulose and hemicellulose content is considered as a dynamic progression towards the advancement in bio products. Hence, this study investigated the possibility of enhancing the saccharification rate of sugar from water hyacinth (Eichhornia crassipes) by microwave heating system. The method of full factorial experimental design was adopted to explore different parameters that influence the conversion rates of fibers into fermentable sugar. The structural changes of the fibers after microwave treatment with dilute sulfuric acid was observed on the residue by using X- ray Diffractometer (XRD), Fourier Transform Infrared Spectrometry (FTIR) and Environmental Scanning Electron Micrograph (ESEM) analysis. The results obtained illustrates that hydrolysis time reduces to approximately 40% and effectively improve the rate of saccharification to 13.94 % with optimal sugar concentration of 4650 mg/L.