

Accepted Manuscript

Title: Utilization of Renewable Durian Peels for Biosorption of Zinc from Wastewater

Authors: Mohammed Ngabura, Siti Aslina Hussain, Wan Azlina W.A. Ghani, Mohammed Saedi Jami, Yen Ping Tan



PII: S2213-3437(18)30173-8
DOI: <https://doi.org/10.1016/j.jece.2018.03.052>
Reference: JECE 2293

To appear in:

Received date: 14-1-2018
Revised date: 18-3-2018
Accepted date: 27-3-2018

Please cite this article as: Mohammed Ngabura, Siti Aslina Hussain, Wan Azlina W.A.Ghani, Mohammed Saedi Jami, Yen Ping Tan, Utilization of Renewable Durian Peels for Biosorption of Zinc from Wastewater, Journal of Environmental Chemical Engineering <https://doi.org/10.1016/j.jece.2018.03.052>

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.

Utilization of Renewable Durian Peels for Biosorption of Zinc from Wastewater

Mohammed Ngabura^a, Siti Aslina Hussain^{a,*}, Wan Azlina W. A. Ghani^a, Mohammed Saedi Jami^b, Yen Ping Tan^c,

^a Department of Chemical and Environmental Engineering, Faculty of Engineering, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

^b Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University Malaysia, P.O. Box 10, 50728, Kuala Lumpur, Malaysia

^c Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

HIGHLIGHTS

- Zinc ion removal by renewable durian peels from contaminated water is proposed.
- Biosorbent modification with HCl acid improved the Zinc biosorption capacity.
- Temkin, Langmuir and pseudo-second-order models were obeyed in batch scale.
- Biosorbent could be utilized up to 5 cycles and beyond.
- HCl is a good modification reagent and best eluent to recover Zinc from wastewater.

Abstract

Durian peel is among the renewable biomass wastes abundantly available in Malaysia. An implication of untreated biological materials for biosorption process was intensively reported, that prioritize our work towards sorbent modification. The biosorption potentials of hydrochloric acid (HCl) modified durian peels (HAMDP) for removal of Zn (II) from simulated wastewater was investigated. Characterization of HAMDP was performed by ATR-FTIR, SEM and BET. Spectroscopic studies showed the predominant contributors for Zn (II) biosorption on HAMDP is attributed to hydroxyl, carbonyl, carboxyl and amides groups. Batch adsorption studies revealed optimum conditions of pH 8, 0.5 g biosorbent dose, 4 hours contact time and reaction temperature of 313 K. Non-linear isotherm models suggested applicability of Tempkin and Langmuir models at 313 K. The Langmuir maximum adsorption capacity was 36.73 mg/g. Kinetic studies revealed

Download English Version:

<https://daneshyari.com/en/article/6664052>

Download Persian Version:

<https://daneshyari.com/article/6664052>

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