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Immobilization of fungal biomass with multi-walled carbon nanotubes as biosorbent

By: [Murad, FN \(Murad, Fatin Nuradilah\)](#)^[1]; [Kabbashi, NA \(Kabbashi, Nassereldeen Ahmed\)](#)^[1]; [Alam, MZ \(Alam, Md Zahangir\)](#)^[1]; [Al-Khatib, MFR \(Al-Khatib, Ma'an Fahmi Rashid\)](#)^[1]

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Abstract

Aim: This study was mainly highlighted on a combination of fungal biomass onto MWCNTs in order to enhance the positive integration of impurities removal in aqueous solution.

Methodology and results: The immobilization of fungal biomass and MWCNTs was done in a batch liquid medium with several factors such as agitation speed, dose of MWCNTs, pH and inoculum dosage that were conducted with one factor at one time (OFAT) method. Basically, to verify the functional group of MWCNTs, *Aspergillus niger* biomass and immobilized *A. niger* biomass, the FTIR was applied and FESEM was done to demonstrate and compare the image of the immobilized *A. niger* biomass with MWCNTs and fungal biomass alone. The finding showed the best agitation speed, dose of MWCNTs, pH and inoculum dosage were 150 rpm, 0.5 g, 5-6 and 2% respectively. FTIR indicates the presents of the functional groups like -OH (3270 cm⁻¹), C-O (1619 cm⁻¹) and -CH (2915 cm⁻¹) while FESEM illustrates the images of the wrapped MWCNTs on *A. niger* biomass.

Conclusion, significance and impact of study: The conventional technique of adsorption of fungal biomass alone not showing a favorable removal of impurities. Thus, the immobilization of fungal biomass (*A. niger*) with multi-walled carbon nanotubes (MWCNTs) was a good combination since both have potential functional group to accumulate to each other and has a tendency to remove effectively and efficiently the impurities in aqueous solution.


Keywords

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Author Information

Reprint Address: Murad, FN (reprint author)

 Int Islamic Univ Malaysia, Fac Engr, Dept Biotechnol Engr, BERK, Kuala Lumpur 50728, Malaysia.

Addresses:

 [1] Int Islamic Univ Malaysia, Fac Engr, Dept Biotechnol Engr, BERK, Kuala Lumpur 50728, Malaysia

E-mail Addresses: ftnnblh1234@gmail.com

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1. **Biosorption of Arsenic(III) from Aqueous Solutions by Modified Fungal Biomass of Paecilomyces sp.** Times Cited: 8
By: Acosta Rodríguez, Ismael; Martínez-Juarez, Víctor M.; Cardenas-Gonzalez, Juan F.; et al.
BIOINORGANIC CHEMISTRY AND APPLICATIONS Article Number: 376780 Published: 2013
2. **Removal and recovery of uranium from aqueous solutions by Trichoderma harzianum** Times Cited: 97
By: Akhtar, Kalsoom; Akhtar, M. Waheed; Khalid, Ahmad M.
WATER RESEARCH Volume: 41 Issue: 6 Pages: 1366-1378 Published: MAR 2007
3. **Removal of cadmium from water by CNT-PAC composite: Effect of functionalization** Times Cited: 1
By: Al-Saadi, M. A.; Al Mamun, A.; Alam, M. Z.; et al.
Nano: Brief Reports and Reviews Volume: 11 Issue: 1 Pages: 1-7 Published: 2016
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4. **Toxicity determinants of multi-walled carbon nanotubes: The relationship between functionalization and agglomeration** Times Cited: 35
By: Allegri, Manfredi; Perivoliotis, Dimitrios K.; Bianchi, Massimiliano G.; et al.
TOXICOLOGY REPORTS Volume: 3 Pages: 230-243 Published: 2016
5. **Characterization of Multiwalled Carbon Nanotubes Dispersing in Water and Association with Biological Effects** Times Cited: 24
By: Cheng, Xuelian; Zhong, Jun; Meng, Jie; et al.
JOURNAL OF NANOMATERIALS Article Number: 938491 Published: 2011
6. **IMPROVEMENT OF HEAVY-METAL BIOSORPTION BY MYCELIAL DEAD BIOMASSES (RHIZOPUS-ARRHIZUS, MUCOR-MIEHEI AND PENICILLIUM-CHRYSOGENUM) - PH CONTROL AND CATIONIC ACTIVATION** Times Cited: 202
By: FOUREST, E; CANAL, C; ROUX, JC
FEMS MICROBIOLOGY REVIEWS Volume: 14 Issue: 4 Pages: 325-332 Published: AUG 1994
7. **Carbon Nanotubes as Supports for Inulinase Immobilization** Times Cited: 16
By: Garlet, Tais B.; Weber, Caroline T.; Klaic, Rodrigo; et al.
MOLECULES Volume: 19 Issue: 9 Pages: 14615-14624 Published: SEP 2014
8. **Optimization for the production of cellulase enzyme from municipal solid waste residue by two novel cellulolytic fungi.** Times Cited: 33
By: Gautam, S P; Bundela, P S; Pandey, A K; et al.
Biotechnology research international Volume: 2011 Pages: 810425 Published: 2011 Jan 23
9. **Polymer hydrogel from carboxymethyl guar gum and carbon nanotube for sustained trans-dermal release of diclofenac sodium** Times Cited: 43
By: Giri, Arindam; Bhowmick, Manas; Pal, Sagan; et al.
INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES Volume: 49 Issue: 5 Pages: 885-893 Published: DEC 1 2011
10. **Production of fungal biomass immobilized loofa sponge (FBILS)-discs for the removal of heavy metal ions and chlorinated compounds from aqueous solution** Times Cited: 26
By: Iqbal, M; Saeed, A; Edyvean, RGJ; et al.
BIOTECHNOLOGY LETTERS Volume: 27 Issue: 17 Pages: 1319-1323 Published: SEP 2005
11. **Gamma-linolenic acid production of Mucor rouxii by solid-state fermentation using agricultural by-products** Times Cited: 20
By: Jangbua, P; Laoteng, K; Kitsubun, P; et al.
LETTERS IN APPLIED MICROBIOLOGY Volume: 49 Issue: 1 Pages: 91-97 Published: JUL 2009
12. **Removal of heavy metals using the fungus Aspergillus niger** Times Cited: 510
By: Kapoor, A; Viraraghavan, T; Cullimore, DR
BIORESOURTE TECHNOLOGY Volume: 70 Issue: 1 Pages: 95-104 Published: OCT 1999