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

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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<sup>-1</sup>), C-O (1619 cm<sup>-1</sup>) and -CH (2915 cm<sup>-1</sup>) 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

**Author Keywords:** Biosorbent; carbon nanotubes; fungal biomass; immobilization

**KeyWords Plus:** HEAVY-METALS; AQUEOUS-SOLUTIONS; REMOVAL; ADSORPTION; BIOSORPTION; POLYMER; IONS

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