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Factors affecting the immobilization of fungal biomass on CNT as a biosorbent for textile dyes removal

(Conference Paper)

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Abstract

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Effluents from dye and textile industries are highly contaminated and toxic to the environment. High concentration of non-biodegradable compounds contributes to increased biochemical oxygen demand (BOD) and chemical oxygen demand (COD) of the wastewater bodies. Dyes found in wastewater from textile industries are carcinogenic, mutagenic or teratogenic. Biological processes involving certain bacteria, fungi and activated carbon have been employed in treating wastewater. These methods are either inefficient or ineffective. These complexities necessitates search for new approaches that will offset all the shortcomings of the present solutions to the challenges faced with textile wastewater management. This study produced a new biosorbent by the immobilization of fungal biomass on carbon nanotubes. The new biosorbent is called "carbon nanotubes immobilized biomass (CNTIB)" which was produced by immobilization technique. A potential fungal strain, Aspergillus Niger was selected on the basis of biomass production. It was found out in this studies that fungal biomass were better produced in acidic medium. Aspergillus Niger was immobilized on carbon nanotubes. One-factor-at-a time (OFAT) was employed to determine the effect of different factors on the immobilization of fungal biomass on carbon nanotubes and optimum levels at which the three selected parameters (pH, culture time and agitation rate) would perform. Findings from OFAT showed that the optimum conditions for immobilization are a pH of 5, agitation rate of 150rpm and a culture time of 5 days. © Published under licence by IOP Publishing Ltd.

Engineering controlled terms: Activated carbon, Aspergillus, Biochemical oxygen demand, Biomass, Chemical compounds, Chemical oxygen demand, Dyes, Effluents, Fungi, Nanotubes, Sorption, Stripping (dyes), Textile industry, Textiles, Wastewater treatment, Yarn

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