



**Bioremoval of Azo Dye derivatives from aqueous solution by application of natural flora;  
free and immobilized bed reactor**

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**Abstract**

Bioadsorption is a promising technique for the removal of textile dyes at relatively low cost and with satisfactory efficiency. This study focuses on the evaluation of bioadsorption capacity of a free and immobilized bed reactor for removal of Azo Dye derivatives. The incubation of the natural flora selected with industrial pollutants was selected to improve the removal of contemplated pollutants with high performance. Immobilized bed reactor with high surface area at 37°C had the best modified protocol for the microbial community formation with surface adsorption to be ready for. After preparation of immobilized beds, the obtained structure was characterized by SEM, and TEM. The influences of adsorbent mass, pH, initial concentration of dye and contact time on the bioadsorption process were characterized by GC-MS. The bioadsorption capacity of the Azo dyes derivatives was controlled for the most part by pH value. TEM analysis for obtained beds showed particles size in the range of 50 to 138 nm. Also, the results showed that several adsorptive improvements that took place in the surface morphology and topology of the immobilized beds. Additionally, the optimum conditions were determined as follows, pH of 8.5, the initial dose of 5g/L Azo dye and contact time of 60 min, that in these circumstances the removal of derivative was around 95%.

**Key words:** Bioadsorption; Natural ; free and immobilized bed; Azo dyes; derivatives.