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Biofiltration of xylene using wood charcoal as the biofilter media under transient and high loading conditions

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ABSTRACT

The main objective of this study was to evaluate the performance of wood charcoal as biofilter media under transient and high loading condition. Biofiltration of xylene was investigated for 150 days in a laboratory scale unit packed with wood charcoal and inoculated with mixed microbial culture at the xylene loading rates ranged from 12 to 553 g m⁻³ h⁻¹. The kinetic analysis of the xylene revealed absence of substrate inhibition and possibility of achieving higher elimination under optimum condition. The pH, temperature, pressure drop and CO₂ production rate were regularly monitored during the experiments. Throughout experimental period, the removal efficiency (RE) was found to be in the range of 65 to 98.7% and the maximum elimination capacity (EC) was 405.7 g m⁻³ h⁻¹. Molecular characterization results show *Bacillus* sp. as dominating microbial group in the biofilm.

Keywords: Biofiltration; Wood charcoal; Xylene; *Bacillus* sp.

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