Enhancement of Ammonia Removal in Peat Biofilter Seeded with Enriched Nitrifying Bacteria

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Source: Environmental Technology, Volume 21, Number 10, 1 October 2000, pp. 1199-1204(6)

Publisher: Selper Ltd

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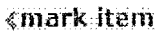

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Abstract:

Night soil sludge was enriched to foster nitrifying bacteria by the addition of ammonium sulfate, and the enriched mixed culture of nitrifying bacteria obtained was inoculated to peat. Ammonia gas was introduced to the peat biofilter by gradually increasing from 48 to 265 ppm, at a space velocity from 87 to 437 h^{-1}, with an ammonia load from 0.5 to 5.8 g N kg^{-1} dry peat d^{-1} for 103 days. The ammonia removal characteristics observed over a 103 day experiment were as follows: an average ammonia removal ratio of 97 %, complete removal capacity of 4.5 g N kg^{-1} dry peat d^{-1}, maximum removal capacity of 5.6 g N kg^{-1} dry peat d^{-1}, maximum removal rate of ammonia, V_m of 46.1 g N kg^{-1} dry peat d^{-1}. The ammonia removal capacity of this peat biofilter was enhanced significantly and the maximum removal capacity and maximum removal rate were the highest among the data reported to date.

Keywords: Ammonia; nitrification; peat biofilter; removal kinetics; nitrifying bacteria

Document Type: Research article

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