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BIOREMEDIATION CONTAINING WASTEWATER BY OF P-NITROPHENOL AEROBIC GRANULES

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Abstract

Aerobic granulation is a novel biotechnique for the treatment of coloured wastewater containing toxic xenobiotics in sequencing batch reactor (SBR). The aerobic granules were investigated as a potential biomaterial for biodegradation of p-nitrophenol. The removal efficiency of p-nitrophenol was 93 % after 65 days of operation at 8 hr hydraulic retention time (HRT). The aerobic granules were cultivated at a p-nitrophenol loading rate of $0.9 \text{ kg m}^{-3} \text{ day}^{-1}$, with sodium acetate as co-substrate to accelerate the growth of p-nitrophenol degrading biomass. SBR was inoculated with activated sludge that was initially conditioned as a batch culture for a period of 30 days by supplying p-nitrophenol. Optimal pH of 9 was maintained throughout the experimental setup. This study clearly demonstrates that aerobic granules are efficient to degrade up to 300 mgL^{-1} of p-nitrophenol to tolerate the toxicity in high-strength wastewater.

Key words: aerobic granules, biodegradation, kinetics, p-nitrophenol, SBR

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