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**Title**

Effects of dissolved oxygen on microbial community of single-stage autotrophic nitrogen removal system treating simulating mature landfill leachate

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**Abstract**

The performance of four identical sequencing biofilm batch reactors (SBBR) for autotrophic nitrogen removal was investigated with 2000 mg/L ammonia-containing mature landfill leachate at 30°C. The main objective of this study was to evaluate the effects of dissolved oxygen (DO) on the performance and microbial community of single-stage nitrogen removal using anammox and partial nitrification (SNAP) system. At an applied load of 0.5 kg N m<sup>-3</sup> d<sup>-1</sup>, average total nitrogen removal efficiency (TNRE) above 90% was long-term achieved with an optimal DO concentration of 2.7 mg/L. The microelectrode-measured profiles showed the microenvironments inside the biofilms. 16S ribosomal Ribonucleic Acid (rRNA) amplicon pyrosequencing and denaturing gradient gel electrophoresis (DGGE) were used to analyze the microbial variations of different DO concentrations and different positions inside one reactor.

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