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Integrating anammox with the autotrophic denitrification process via electrochemistry technology

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1 Integrating anammox with the autotrophic denitrification process via electrochemistry
2 technology

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12 **ABSTRACT:** In this study, an autotrophic denitrification process was successfully
13 coupled with anammox to remove the nitrate by-product via electrochemical
14 technology. When the voltage applied to the combined electrode reactor was 1.5 V, the
15 electrode reaction removed nitrate by using the autotrophic denitrification biomass
16 without affecting the anammox biomass. The nitrogen removal efficiency of the
17 combined electrode reactor reached 99.1% without detectable nitrate at an influent
18 NO_2^- -N/ NH_4^+ -N ratio of 1.5. On day 223, using the model calculations based on
19 reaction equations, 19.7% of total nitrogen was removed via the autotrophic
20 denitrification process, while the majority of nitrogen removal (approximately 79.4%)
21 was attributed to the anammox reaction. Small variations of the population numbers
22 and community structure of artificial bacteria according to electron microscopy

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