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1 **Effects of salinity on the denitrification efficiency and community structure of a**
2 **combined partial nitrification- anaerobic ammonium oxidation process**

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9 **ABSTRACT:** The effects of salinity changes on nitrogen transformation efficiency and
10 recoverability were studied by using a partial nitrification (PN)- anaerobic ammonium
11 oxidation (Anammox) integrated reactor. The changes of microbial community structure
12 and population abundance during the increase and decrease of salinity were also analyzed
13 by 16S rRNA gene high-throughput sequencing. The results showed that when the salinity
14 was increased to 1.35‰, the combined PN-Anammox process achieved the maximum
15 stimulated and total nitrogen removal rate (TNRR) arrived at 1.1 kg/(m³·d). When the
16 salinity was higher than 1.35‰, the activities of AOB and Anammox bacteria began to be
17 inhibited. When the salinity reached 2.4‰, the TNRR decreased to 60%. TNRR was fast
18 restored, when salinity was reduced to 0.11‰. The genes of AOB and Anammox bacteria
19 indicated that the TNRR of the reactor was restored after salinity inhibition, but the
20 functional microbial community structure and abundance had relatively large, irreversible

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