

Accepted Manuscript

Nitrogen removal and intentional nitrous oxide production from reject water in a coupled nitrification/nitrous denitrification system under real feed-stream conditions

Max Weißbach, Paul Thiel, Jörg E. Drewes, Konrad Koch

PII: S0960-8524(18)30094-4

DOI: <https://doi.org/10.1016/j.biortech.2018.01.080>

Reference: BITE 19437

To appear in: *Bioresource Technology*

Received Date: 5 December 2017

Revised Date: 14 January 2018

Accepted Date: 16 January 2018

Please cite this article as: Weißbach, M., Thiel, P., Drewes, J.E., Koch, K., Nitrogen removal and intentional nitrous oxide production from reject water in a coupled nitrification/nitrous denitrification system under real feed-stream conditions, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.01.080>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



1 **Nitrogen removal and intentional nitrous oxide production from reject water in**
2 **a coupled nitrification/nitrous denitrification system under real feed-stream**
3 **conditions**

4 Max Weißbach, Paul Thiel, Jörg E. Drewes, and Konrad Koch*

5 Chair of Urban Water Systems Engineering, Technical University of Munich, Am Coulombwall 3, 85748

6 Garching, Germany.

7 *corresponding author: Konrad Koch, e-mail address: k.koch@tum.de, phone: +49.89.289.13706

8
9 **Abstract**

10 A Coupled Aerobic-anoxic Nitrous Decomposition Operation (CANDO) was performed
11 over five months to investigate the performance and dynamics of nitrogen elimination and
12 nitrous oxide production from digester reject water under real feed-stream conditions. A
13 93% conversion of ammonium to nitrite could be maintained for adapted seed sludge in the
14 first stage (nitrification). The second stage (nitrous denitrification), inoculated with
15 conventional activated sludge, achieved a conversion of 70% of nitrite to nitrous oxide after
16 only 12 cycles of operation. The development of an alternative feeding strategy and the
17 addition of a coagulant (FeCl_3) facilitated stable operation and process intensification.
18 Under steady-state conditions, nitrite was reliably eliminated and different nitrous oxide
19 harvesting strategies were assessed. Applying continuous removal increased N_2O yields by
20 16% compared to the application of a dedicated stripping phase. These results demonstrate
21 the feasible application of the CANDO process for nitrogen removal and energy recovery
22 from ammonia rich wastewater.

23

Download English Version:

<https://daneshyari.com/en/article/7067986>

Download Persian Version:

<https://daneshyari.com/article/7067986>

[Daneshyari.com](https://daneshyari.com)