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Authors: Yuqi Wu, Kang Song, Yinghe Jiang, Xiaoyan Sun, Lu Li



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Effect of thermal hydrolysis sludge supernatant as carbon source for biological denitrification with pilot-scale two-stage anoxic/oxic process and nitrogen balance model establishment

Yuqi Wu^{1,2}, Kang Song^{1*}, Yinghe Jiang², Xiaoyan Sun¹, Lu Li¹

¹ *Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan 430072, China*

² *School of Civil Engineering and Architecture, Wuhan University of Technology, Wuhan 430070, China*

*Corresponding author: sk@ihb.ac.cn (K. Song). woshiyaya7@126.com (Y. Wu), jyhe123@163.com (Y. Jiang), sunxy@ihb.ac.cn (X. Sun), lilu@ihb.ac.cn (L. Li).

Highlights

- The optimal C-source recovery conditions for pilot-scale THP were determined.
- Thermal hydrolysis sludge supernatant was used as C-source for N removal.
- A pilot-scale THP combining an A/O/A/O process for denitrification was operated.
- Satisfied denitrification effects were achieved with hydrolysed sludge addition.
- N balance model was established for A/O/A/O process and showed satisfied accuracy.

ABSTRACT

To recover carbon source (C-source) from waste activated sludge (WAS) and enhance the nitrogen removal performance, a pilot-scale system consisting of two-stage anoxic/oxic (A/O) process and low-temperature thermal hydrolysis process (THP) was proposed. The C-source recovery parameters for pilot THP were determined by systematically considering the results of orthogonal jar experiment, hydrolyzed sludge biodegradability and actual pilot situation. The

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