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# DIFFICULTIES IN THE ANAMMOX PROCESS START-UP IN SEQUENCING BATCH REACTOR AT LOW TEMPERATURE

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A promising technology offering significant environmental benefits compared to classical nitrification/denitrification processes appears to be the partial nitrification/ Anammox that can be carried out in a one single reactor. In this paper the results of start-up of the CANON process in two lab-scale Sequencing Batch Reactors with continuous and batch flow, at low temperature (20±2°C) were presented. The results indicate that the CANON process in its initial phase is characterised by high instability. It was showed that the system needs the intensive control of basic technological parameters and that the temperature of 20±2°C is insufficient for the fast start-up of the CANON process. During first four months of the research, the stable CANON process was not achieved. Further analysis on this pilot-scale system showed that Anammox appeared after about 5,5 months. Results also showed that dissolved organic and free ammonia is the key factor to start-up CANON process.

Keywords: nitrogen removal, Anammox, wastewater treatment, activated sludge.

## Introduction

Nitrogen is one of the most essential macroelement in the environment necessary for all living organisms and being nearly 6% of their dry weight (Bonete et al., 2008). Intense human activity in recent years, such as the production and using of nitrogen-based fertilizers and combustion of fossil fuels, has resulted in an imbalance in the turnover of nitrogen compounds in nature. Moreover, it has contributed to a significant increase of this compound in certain types of soils and water (van den Berg and Ashmore, 2008). Many of the nitrogen compounds (mainly in the inorganic forms) can be extremely harmful and (even at low concentrations) cause significant damage to the ecosystem and living organisms as well. There are methods designed for treating wastewater from nitrogen

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