

## Control of a Biological Nitrogen Removal Process in an Intensified Single Reactor Configuration - DTU Orbit (09/11/2017)

### Control of a Biological Nitrogen Removal Process in an Intensified Single Reactor Configuration

The nitrogen removing granular sludge process is a novel and intensified process. However, its stable operation and control remains a challenging problem. In this contribution, a new process oriented approach is used to develop, evaluate and benchmark control strategies to ensure stable operation and rejection of disturbances. Three control strategies were developed: a feedforward control (case 1), a rule-based feedback control (case 2), and a feedforward-feedback controller, in which the feedback loop updates the set point of the feedforward loop (case 3). The case 1 controller, based on influent measurements, was giving the best performance against disturbances in the ammonium concentration, whereas case 2 was providing the best performance against disturbances in the organic carbon concentration. The case 3 controller rejected both disturbances satisfactorily. Thus, this controller provided versatility towards disturbance rejection, however through a less tight control, which meant a bigger offset from the removal efficiency.

#### General information

State: Published

Organisations: Computer Aided Process Engineering Center, Department of Chemical and Biochemical Engineering, Center for Process Engineering and Technology, Department of Environmental Engineering

Authors: Vangsgaard, A. K. (Intern), Mauricio Iglesias, M. (Intern), Gernaey, K. (Intern), Smets, B. F. (Intern), Sin, G. (Intern)

Pages: 769-774

Publication date: 2013

#### Host publication information

Title of host publication: 23rd European Symposium on Computer Aided Process Engineering – ESCAPE 23

Publisher: Elsevier Science

Main Research Area: Technical/natural sciences

Conference: 23rd European Symposium on Computer Aided Process Engineering, Lappeenranta, Finland, 09/06/2013 - 09/06/2013

DOIs:

10.1016/b978-0-444-63234-0.50129-9

#### Bibliographical note

Anna Katrine Vangsgaard, Miguel Mauricio-Iglesias, Krist V. Gernaey, Barth F. Smets, Gürkan Sin, 2013, "Control of a Biological Nitrogen Removal Process in an Intensified Single Reactor Configuration", Computer-Aided Chemical Engineering Series, Volume 32, pp. 769-774

Reviewed Conference proceeding

Source: dtu

Source-ID: u::8706

Publication: Research - peer-review › Article in proceedings – Annual report year: 2013