



## Ammonia inhibition threshold during continuous biomethanation process

Yan, Miao; Tian, Hailin; Fotidis, Ioannis; Khoshnevisana, B.; Tsapekos, Panagiotis; Angelidaki, Irini

*Published in:*  
Sustain Conference 2018

*Publication date:*  
2018

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Yan, M., Tian, H., Fotidis, I., Khoshnevisana, B., Tsapekos, P., & Angelidaki, I. (2018). Ammonia inhibition threshold during continuous biomethanation process. In C. M., & K. M. (Eds.), *Sustain Conference 2018: Creating Technology for a Sustainable Society* Article X-1 Technical University of Denmark. <http://www.sustain.dtu.dk/>

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## Ammonia inhibition threshold during continuous biomethanation process

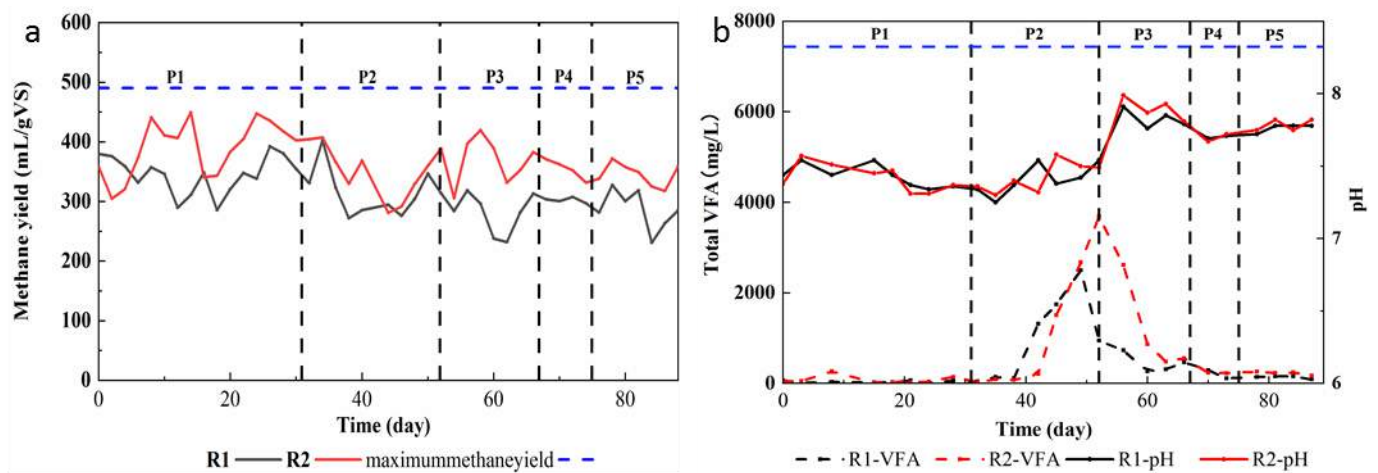
M. Yan<sup>1</sup>, H. Tian<sup>2</sup>, I. A. Fotidis<sup>2</sup>, B. Khoshnevisana<sup>2</sup>, P. Tsapekos<sup>2</sup> and I. Angelidaki<sup>3</sup>

\* Department of Environmental Engineering, Technical University of Denmark, Bygningstorvet Bygning 115, DK-2800 Kgs. Lyngby, DK

(E-mail: [ioanf@env.dtu.dk](mailto:ioanf@env.dtu.dk))

### Abstract

The protein-rich organic waste is widely used as substrate for anaerobic digestion due to its high methane potential. However, the high ammonia levels formed from the protein-rich substrate degradation inhibit anaerobic digestion process and consequently result in the methane production loss. In the present study, the ability of microbial community to acclimatize to extremely high total ammonia levels (7 g NH<sub>4</sub><sup>+</sup>-N/L) through stepwise acclimatization was assessed in two mesophilic continuous stirred tank reactors, fed with the organic fraction of municipal solid waste. To understand how the digesters respond to the different ammonia levels (from 1.2 to 7 g NH<sub>4</sub><sup>+</sup>-N/L), the methane production and the volatile fatty acids (VFA) levels were monitored throughout the experimental period. The results showed that the stepwise acclimatization was successful up to 7 g NH<sub>4</sub><sup>+</sup>-N/L; where the methane production fluctuated less than 10% compared to the reactors' methane yield in phase 1 and VFA was less than 4000 mg/L (no extra ammonia addition).



**Figure 1.1** a) Methane yield and TAN change, b) VFA and pH variation throughout the experimental period