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# Ammonia inhibition threshold during continuous biomethanation process

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## 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 $NH_4^+$-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 $NH_4^+$-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 $NH_4^+$-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).

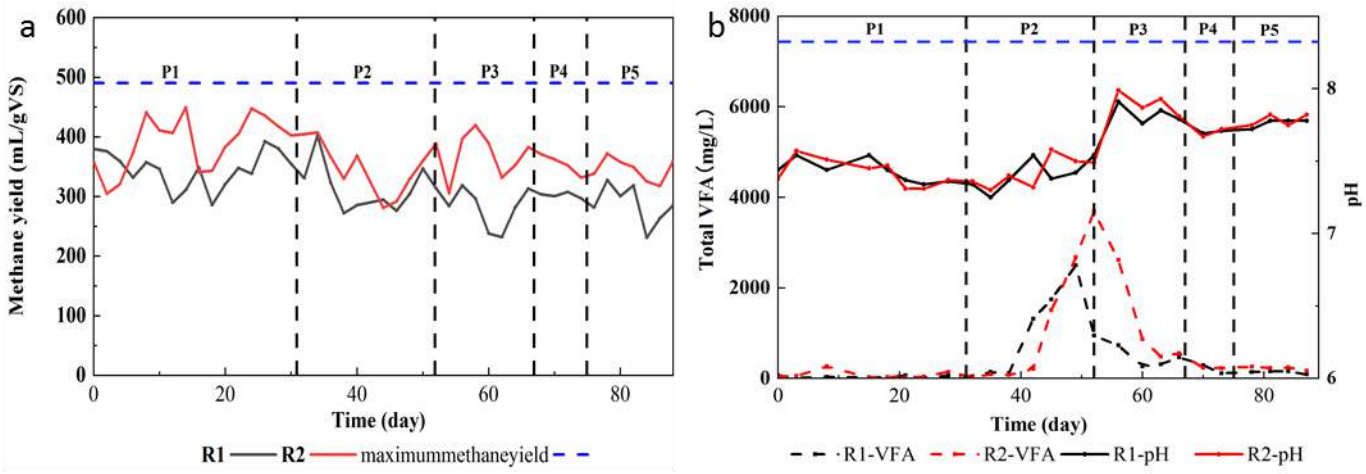


**Figure 1.1** a) Methane yield and TAN change, b) VFA and pH variation throughout the experimental period