

Accepted Manuscript

A novel strategy for simultaneous removal of nitrogen and organic matter using anaerobic granular sludge in anammox hybrid reactor

Swati Tomar, Sunil Kumar Gupta, Brijesh Kumar Mishra

PII: S0960-8524(15)01163-3
DOI: <http://dx.doi.org/10.1016/j.biortech.2015.08.057>
Reference: BITE 15410

To appear in: *Bioresource Technology*

Received Date: 27 June 2015
Revised Date: 10 August 2015
Accepted Date: 12 August 2015



Please cite this article as: Tomar, S., Gupta, S.K., Mishra, B.K., A novel strategy for simultaneous removal of nitrogen and organic matter using anaerobic granular sludge in anammox hybrid reactor, *Bioresource Technology* (2015), doi: <http://dx.doi.org/10.1016/j.biortech.2015.08.057>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A novel strategy for simultaneous removal of nitrogen and organic matter using anaerobic granular sludge in anammox hybrid reactor

Swati Tomar¹, Sunil Kumar Gupta^{2*}, Brijesh Kumar Mishra³

¹Senior Research Fellow, Department of Environmental Science & Engineering, Indian School of Mines, Dhanbad- 826004, Email: tomarswati4@gmail.com, Phone No.: +91-326-2235474, Fax: +91-326-2296624

^{2*}Associate Professor, Department of Environmental Science & Engineering, Indian School of Mines, Dhanbad- 826004, Email: skgsunil@gmail.com, Phone No.: +91-326-2235474, Fax: +91-326-2296624 (Corresponding Author)

³Assistant Professor, Department of Environmental Science & Engineering, Indian School of Mines, Dhanbad- 826004, Email: bkmishra3@rediffmail.com, Phone No.: +91-326-2235752, Fax: +91-326-2296624

Abstract

The coexistence of organic matter (OM) and nitrogen in industrial effluent is the major bottleneck in field application of anammox process. The present study emphasized on investigating the role of seeding anaerobic granular sludge towards simultaneous removal of ammonium and OM in anammox hybrid reactor (AHR). The study delineated simultaneous reduction of both OM (94.8%) and nitrogen (96.8%) at optimal COD/N ratio (0.54). Pearson correlation matrix showed positive and strong correlation of ARE (ammonium removal efficiency) and CRE (COD removal efficiency) with NRE (nitrogen removal efficiency). The negative correlation of OLR and COD/TN ratio with NRE indicated that increase in organic loadings may suppress anammox activity. The process inhibition was evaluated using Haldane model considering free ammonia, OM and nitrite as inhibitors. The strategy of using anaerobic granular sludge not only augmented endurance of bacterial communities against OM inhibition but also facilitated simultaneous removal of OM and nitrogen.

Keywords: Anammox, AHR, organic matter, nitrogen removal, modelling, inhibition kinetics.

INTRODUCTION

Download English Version:

<https://daneshyari.com/en/article/7073260>

Download Persian Version:

<https://daneshyari.com/article/7073260>

[Daneshyari.com](https://daneshyari.com)