

Accepted Manuscript

Review

Recent Advances on biogranules formation in dark hydrogen fermentation system: Mechanism of formation and microbial characteristics

J. Rajesh Banu, R. Yukesh Kannah, M. Dinesh Kumar, M. Gunasekaran, Periyasamy Sivagurunathan, Jeong Hoon Park, Gopalakrishnan Kumar

PII: S0960-8524(18)30931-3
DOI: <https://doi.org/10.1016/j.biortech.2018.07.034>
Reference: BITE 20164

To appear in: *Bioresource Technology*

Received Date: 15 May 2018
Revised Date: 6 July 2018
Accepted Date: 7 July 2018

Please cite this article as: Banu, J.R., Yukesh Kannah, R., Dinesh Kumar, M., Gunasekaran, M., Sivagurunathan, P., Park, J.H., Kumar, G., Recent Advances on biogranules formation in dark hydrogen fermentation system: Mechanism of formation and microbial characteristics, *Bioresource Technology* (2018), doi: <https://doi.org/10.1016/j.biortech.2018.07.034>

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.



Recent Advances on biogranules formation in dark hydrogen fermentation system:**Mechanism of formation and microbial characteristics**

Rajesh Banu J¹ Yukesh Kannah R¹ Dinesh Kumar M¹ Gunasekaran M² Periyasamy

Sivagurunathan³ Jeong Hoon Park⁴ Gopalakrishnan Kumar^{5*}

¹ Department of Civil Engineering, Regional Campus Anna University Tirunelveli, Tamilnadu, India

² Department of Physics, Regional Campus Anna University Tirunelveli, Tamilnadu, India

³ Department of Bioenergy, Indian Oil R and D Centre, Sector-13, Faridabad, Haryana-121007, India

⁴ School of Civil, Environmental and Architectural Engineering, Korea University, Seoul, South Korea

⁵ Green Processing, Bioremediation and Alternative Energies Research Group,
Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, Vietnam

Abstract

Hydrogen producing granules (HPGs) are most promising biological methods used to treat organic rich wastes and generate clean hydrogen energy. This review provides information regarding types of immobilization, supporting materials and microbiome involved on HPG formation and its performances. In this review, importance has been given to three kinds of immobilization techniques such as adsorption, encapsulation, and entrapment. The HPG, characteristics and types of organic and inorganic supporting materials followed for enhancing hydrogen yield were also discussed. This review also considers the applications of HPG for sustainable and high rate hydrogen production. A detailed discussion on insight of key mechanism for HPGs formation and its performances for stable operation of high rate hydrogen production system are also provided.

Keywords: granulation; hydrogen; immobilization; dark fermentation

*Corresponding Author's Address:

Dr. Gopalakrishnan Kumar,

Green Processing, Bioremediation and Alternative Energies Research Group, Faculty of Environment and Labour Safety, Ton Duc Thang University, Ho Chi Minh City, Vietnam.

E-mail: gopalakrishnankumar@tdt.edu.vn

Download English Version:

<https://daneshyari.com/en/article/11003482>

Download Persian Version:

<https://daneshyari.com/article/11003482>

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