

Environmental Science Water Research & Technology

IN THIS ISSUE

EDITORIAL

1720

Anaerobic technology

Jeremy Guest, Paige Novak* and Aijie Wang

Guest Editors Paige Novak, Jeremy Guest and Aijie Wang introduce the Anaerobic technology themed issue of *Environmental Science: Water Research & Technology*.

TUTORIAL REVIEW

1721

Trickling filters following anaerobic sewage treatment: state of the art and perspectives

T. Bressani-Ribeiro,* P. G. S. Almeida, E. I. P. Volcke and C. A. L. Chernicharo

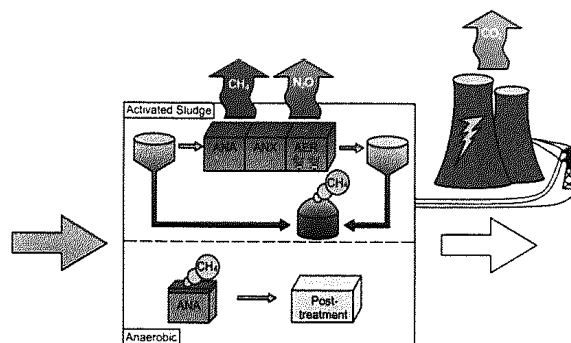
This paper reviews the experience of the last 20 years of research, design and operation of UASB/TF systems.

1739

Emerging investigators series: revisiting greenhouse gas mitigation from conventional activated sludge and anaerobic-based wastewater treatment systems

Siming Chen, Moustapha Harb, Pooja Sinha and Adam L. Smith*

Elucidation of N₂O formation mechanisms in aerobic-based wastewater treatment is essential for effective greenhouse gas mitigation, whereas mainstream anaerobic treatment requires improved methane recoverability.

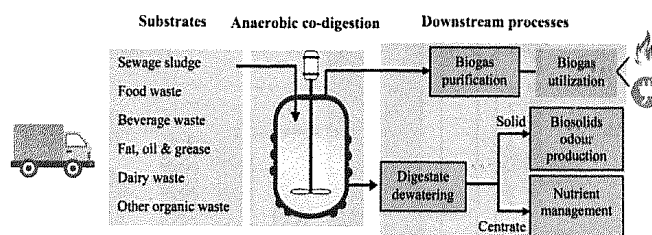


1759

Current status and perspectives on anaerobic co-digestion and associated downstream processes

Sihuang Xie, Matthew J. Higgins, Heriberto Bustamante, Brendan Galway and Long D. Nghiem*

Anaerobic co-digestion (AcoD) has the potential to utilise spare digestion capacity at existing wastewater treatment plants to simultaneously enhance biogas production by digesting organic rich industrial waste and achieve sustainable organic waste management.



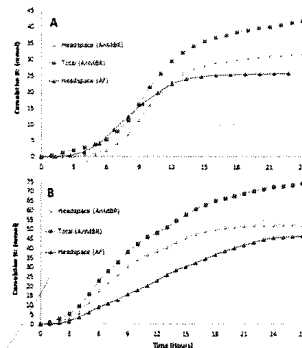
PAPERS

1771

Anaerobic membrane gas extraction facilitates thermophilic hydrogen production from *Clostridium thermocellum*

Scott Singer, Lauren Magnusson, Dianxun Hou, Jonathan Lo, Pin-Ching Maness* and Zhiyong Jason Ren*

Clostridium thermocellum is among the most efficient bacteria to convert cellulosic biomass into H₂ during dark fermentation.

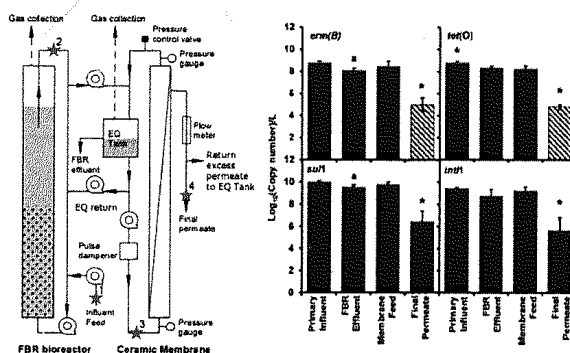


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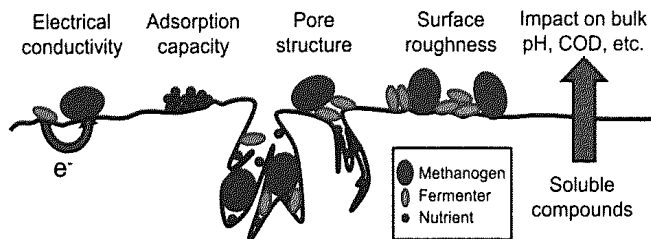
Removal of antibiotic resistance genes in an anaerobic membrane bioreactor treating primary clarifier effluent at 20 °C

Anthony D. Kappell, Lee K. Kimbell, Matthew D. Seib, Daniel E. Carey, Melinda J. Choi, Tino Kalayil, Masanori Fujimoto, Daniel H. Zitomer and Patrick J. McNamara*

Antibiotic resistance genes are removed by anaerobic membrane bioreactors at 20 °C.



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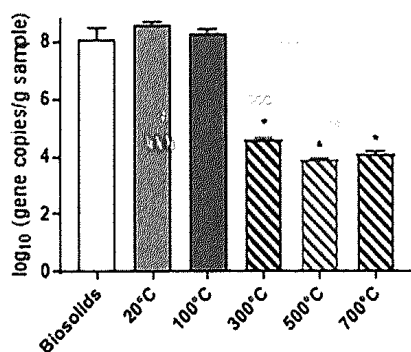


Amending anaerobic bioreactors with pyrogenic carbonaceous materials: the influence of material properties on methane generation

Qiwen Cheng, Francis L. de los Reyes III and Douglas F. Call*

The impact of pyrogenic carbonaceous material amendments on methane production in short-term anaerobic batch reactors depended on multiple material properties, including, but not limited to, electrical conductivity.

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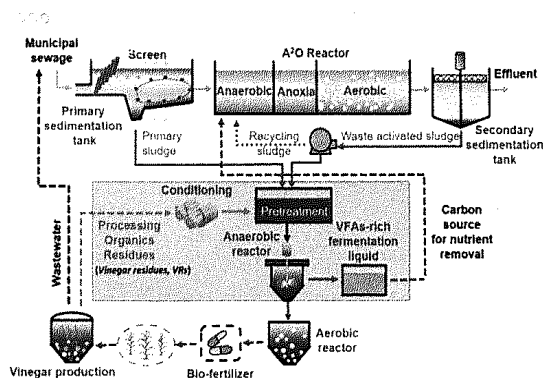


Effect of pyrolysis on the removal of antibiotic resistance genes and class I integrons from municipal wastewater biosolids

Lee K. Kimbell, Anthony D. Kappell and Patrick J. McNamara*

Biosolids carry a substantial portion of antibiotic resistance genes (ARGs) leaving wastewater treatment plants. Pyrolysis substantially reduces ARGs in biosolids.

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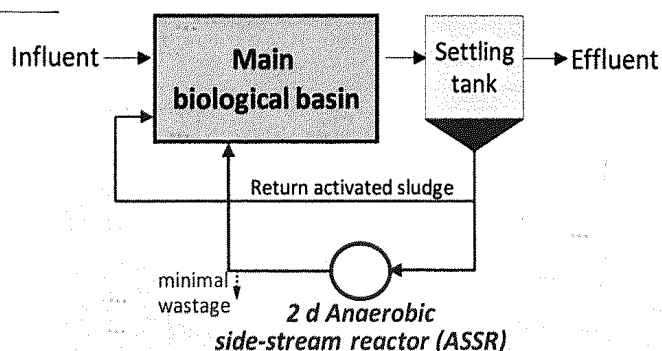


Efficient biorefinery of waste activated sludge and vinegar residue into volatile fatty acids: effect of feedstock conditioning on performance and microbiology

Aijuan Zhou,* Zhihong Liu, Cristiano Varrone, Yunbo Luan, Wenzong Liu, Aijie Wang and Xiuping Yue*

Biorefinery of waste activated sludge into carboxylic acids, particularly low molecular fatty acids, is of major interest due to its carbonaceous characteristics.

1829



Investigation of sludge reduction and biogas generation in high-rate anaerobic side-stream reactors for wastewater treatment

Chul Park,* Dong-Hyun Chon, Aaron Brennan and Heonseop Eom

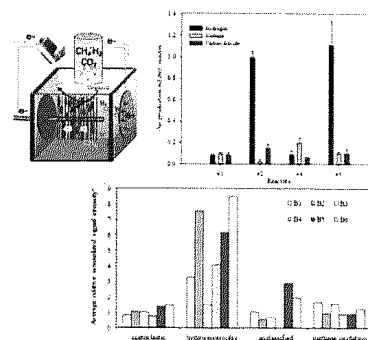
Activated sludge systems incorporating a 2 day anaerobic side-stream reactor (ASSR) show significantly decreased waste sludge production.

1839

Hydrogen consumption and methanogenic community evolution in anodophilic biofilms in single chamber microbial electrolysis cells under different startup modes

Wenzong Liu, Yongjian Piao, Fugui Zhang, Lin Liu, Dongfang Meng, Jun Nan, Ye Deng* and Aijie Wang*

GeoChips based on *mcrA* and cytochrome genes to evaluate community structure variety of methanogens and electron transfer process.

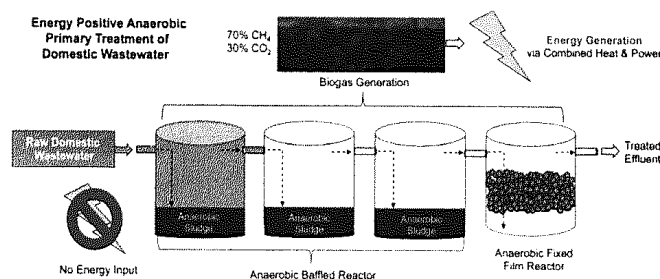


1851

An anaerobic hybrid bioreactor for biologically enhanced primary treatment of domestic wastewater under low temperatures

Andrew Pfluger,* Gary Vanzin, Junko Munakata-Marr and Linda Figueroa

Anaerobic hybrid reactor system for the generation of methane-rich biogas and energy. An energy-positive alternative to conventional primary treatment of raw domestic wastewater.

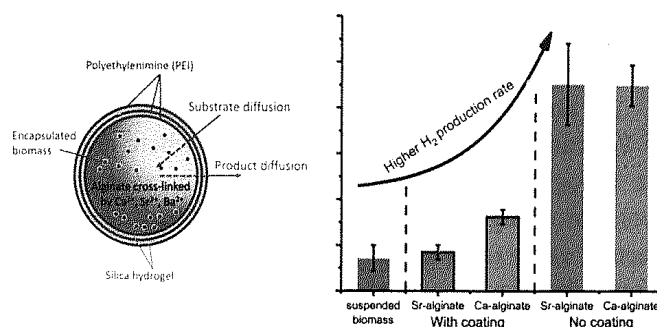


1867

Achieving high-rate hydrogen recovery from wastewater using customizable alginate polymer gel matrices encapsulating biomass

Kuang Zhu,* William A. Arnold, Jonathan Sakkos, Craig Warren Davis and Paige J. Novak*

Alginate encapsulation matrices selectively retained hydrogen producing biomass, achieving reliable high-rate production of hydrogen at various operating conditions.



1877

Exploring the limits of anaerobic biodegradability of urban wastewater by AnMBR technology

A. Seco, O. Mateo, N. Zamorano-López, P. Sanchis-Perucho, J. Serralta, N. Martí,* L. Borrás and J. Ferrer

Anaerobic membrane bioreactors (AnMBRs) can achieve maximum energy recovery from urban wastewater (UWW) by converting influent COD into methane.

