

3rd International Conference on Earth Science & Climate Change

July 28-30, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

DHS Bio-tower in combination with UASB an innovative system for sewage treatment

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Satisfactory disposal of wastewater, whether by surface, subsurface methods or dilution, is dependent on its treatment prior to disposal. Adequate treatment is necessary to prevent contamination of receiving waters to a degree which might interfere with their best or intended use, whether it be for water supply, recreation, or any other required purpose. The sewage treatment technologies have proven to be expensive, complex and are failing to cater to the total wastewater generated. The untreated/partially treated wastewater makes its way to the water body causing immense degradation of the ecosystem and the environmental health. Some effective, advanced treatment technologies take high construction and maintenance costs, high energy consumption. Need is for sustainable wastewater treatment technologies - to locally treat the sewage and also reuse. The decentralized sewage treatment can be both electro-mechanical system that have higher energy requirement or natural systems with less or no energy requirement. Substantial efforts are being made to document, understand, and explain the science behind these issues all over the world. The DHS (Down-flow Hanging Sponge) Bio-Tower based on anammox process in combination with UASB (Upward Flow Anaerobic Sludge Blanket) is one of the economically attractive systems for sewage treatment & well suited for tropical and subtropical countries. The DHS Bio reactors employing different sizes of sponge media exhibit excellent performance in removal of BOD, COD and ammonium nitrogen, at a fixed hydraulic retention time. Wastewater is trickled from the top of the reactor and is allowed to flow vertically down through the reactor containing microorganisms, retained both inside and outside of the sponge media. The results of investigations show that smaller sponge media produced better removal efficiencies and may be due to better oxygen uptake in the stream flowing down through reactor.

Biography

Rakesh Kumar Bhardwaj has completed his PhD from Kurukshetra University, India. He is working as Principal at Dyal Singh College Karnal India since Sept 2012. Before that he has been working as Associate Professor in the Department of Chemistry, Dyal Singh. His research interest includes the physico-chemical and spectroscopic studies of binary liquid mixtures including the H-bonded dimers structure using DFT (Density Functional Theory). He has published more than 35 research papers in the journals of international repute and has written 12 text books of physical chemistry. He has orally presented his research papers and talk at a number of international conferences in India and abroad. He is the recipient of many fellowship & travel grants from international organizations. Moreover in 2011, he was shortlisted among the top ten finalists for the best Chemistry Teacher award on all India base and was awarded the certificate of recognition by Tata Group in combination with ACT, NCL Pune and IISC Bangalore.

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