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Perspective of fermentative H₂ production technology from biomass for commercialization

Fossil fuels depletion and environmental pollution are the major challenges facing mankind today, which have driven worldwide research to develop a sustainable source of energy that can replace fossil fuels and does not have a negative impact on the environment. During the past decades, hydrogen has been suggested as a future energy carrier due to its clean, efficient and non-polluting characteristics, which provide security to our energy supply, security to our economy, and security to our environment. This presentation will give an overview of Fermentative H₂ Production from biomass. In Asia, almost all researchers focus on fermentative method, even in Japan. However, some utilize photo-methods in Europe and most researchers study on photo-methods in USA. The key for commercialization of fermentative hydrogen is low cost H₂. There are four significant bottlenecks for commercialization in future, including high efficiency, continuous flow, technology and resources. Our works provide clear pathway to the commercialization of hydrogen production through Bio-Hydrogen of Carbohydrate Fermentation by Anaerobic Activated Sludge Process. pilot-scale research was accomplished 5.7m³-H₂/d in 1999 and full-scale research was also accomplished 347m³-H₂/d in 2005. A novel type of fermentation was discovered as ethanol fermentation for H₂ production. And a novel Novel Genus, *Ethanoligenens harbinense* gen. nov., sp. nov., was isolated from high efficient reactor. Finally, the challenges from biomass resource were discussed.

Biography

Nanqi Ren is the Professor of Harbin Institute of Technology (HIT), is the Vice President of HIT and Director of State Key Laboratory of Urban Water Resource and Environment. He is the Member of China Academy of Engineering, the Chairman of Technical Expert Committee of Sponge City Construction of Ministry of Housing and Urban-Rural Development (MOHURD). He focuses on Environmental Biotechnology, Bio-energy Technology, and R&D of novel industrial wastewater treatment technique and equipment, etc. He has gained three National Science and Technology Awards, and Science and Technology Awards of Ho Leung Ho Lee foundation published over 400 papers, 12 books, and obtained more than 60 granted patents.

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