

Importance of Granulation to Promote Clean Energy Production and Effluent Treatment in the Anaerobic Hybrid Reactor (AHR)

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ABSTRACT

Anaerobic reactors have acquired a new relevance in recent years due to their ability to generate methane from biodegradable wastewaters—thereby producing clean energy. Methane capture in this way prevents the outflow of the greenhouse gas to the air, which otherwise occurs when anaerobic conditions develop in drains and outfalls carrying wastewater. About 80% of the world's anaerobic wastewater treatment systems are estimated to be based on the UASB technology. The performance of a UASB reactor revolves round its sludge bed which gets expanded as the wastewater is made to flow vertically upwards through it. It is the micro flora attached to the sludge particles which acts upon the sewer water. Hence the quality of bio-fuels sported by the sludge particles, and the tightness of the sludge–wastewater contact are the factors which, principally, govern the success of a UASB reactor. Early in the development of UASB technology, it was realized that granular sludge of appropriate particle size, particle density, and microfilm characteristics enhances the reactor efficiency in terms of the rate as well as the extent of wastewater treatment.