University of Hawai`i at Mānoa

Hawai`i Natural Energy Institute

School of Ocean & Earth Science & Technology

Two-Phase Production of H_2/CH_4 Mixtures

An anaerobic digestion process to produce hydrogen and methane (CH_4) in two sequential stages was investigated, using two bioreactors of 2 and 15 liter working volume, respectively. This relative volume ratio (and shorter retention time in the second, CH_4-producing, reactor) was selected, in part, to test the assumption that separation of phase can enhance metabolism in the second methane-producing reactor. The reactor system was seeded with conventional anaerobic digester sludge, fed with a glucose-yeast extract-peptone medium and operated under conditions of relatively low mixing, to simulate full-scale systems. A total of nine steady states were investigated, spanning a range of feed concentrations, dilution rates, carbon-to-nitrogen ratios in the feed and degree of integration of the two stages. The performance of this two-stage process and potential practical applications for the production of clean-burning hydrogen-methane mixtures are discussed.

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3:15 – 4:15 PM
HIG Auditorium, Room 110

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