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Disperser-induced bacterial disintegration of partially digested anaerobic sludge for efficient biomethane recovery

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Abstract

The present study highlights the options to enhance the methane potential of partially digested anaerobic sludge using disperser-induced bacterial disintegration. Floc dispersion with no biomass disintegration was achieved at a disperser-specific energy input of 9.5 kJ/kg TS. The outcomes of both sole bacterial disintegration (S-BD) and disperser-induced bacterial disintegration (D-BD) were assessed in terms of changes in lysate, biopolymer release and increase in biodegradability and methane generation. A higher lysate solubilization of about 22.4 % was achieved in D-BD compared to S-BD (11.3%), indicating the efficiency of floc dispersion prior to bacterial disintegration. The biochemical methane result implies that D-BD shows higher methane potential of 0.279 gCOD/gCOD. Considering the overall outcome achieved in this study, disperser-induced bacterial disintegration is proved to be an effective disintegration process for enhanced biodegradation and higher methane production.

Keywords: anaerobic sludge; disperser; bacterial disintegration; lysate solubilization; biochemical methane potential

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