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Kinetic Modeling Study and Scale-Up of Niogas Generation Using Garden Grass and Cattle Dung as Feedstock

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Abstract : In this study we investigate the use of a laboratory batch digester to derive kinetic parameters for anaerobic digestion of garden grass and cattle dung. Laboratory experimental data from a 5 liter batch digester operating at mesophilic temperature of 32 C is used to derive parameters for Michaelis-Menten kinetic model. These fitted kinetics are further used to predict the scale-up parameters of a batch digester using DynoChem modeling and scale-up software. The scale-up model results are compared with performance data from 20 liter, 50 liter, and 200 liter batch digesters. Michaelis-Menten kinetic model shows to be a very good and easy to use model for kinetic parameter fitting on DynoChem and can accurately predict scale-up performance of 20 liter and 50 liter batch reactor based on parameters fitted on a 5 liter batch reactor.

Keywords : Biogas, kinetics, DynoChem Scale-up, Michaelis-Menten
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