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**Co-digestion of solid waste: Towards a simple model to predict methane
production**

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Abstract

Modeling methane production is a key issue for solid waste co-digestion. Here, the effect of a step-wise increase in the organic loading rate (OLR) on reactor performance was investigated, and four new models were evaluated to predict methane yields using data acquired in batch mode. Four co-digestion experiments of mixtures of 2 solid substrates were conducted in semi-continuous mode. Experimental methane yields were always higher than the BMP values of mixtures calculated from the BMP of each substrate, highlighting the importance of endogenous production (methane produced from auto-degradation of microbial community and generated solids). The experimental methane productions under increasing OLRs corresponded well to the modeled data using the model with constant endogenous production and kinetics identified at 80% from total batch time. This model provides a simple and useful tool for technical design consultancies and plant operators to optimize the co-digestion and the choice of the OLRs.

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