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Metabolic modeling of the substrate competition among multiple VFAs for PHA production by mixed microbial cultures

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Highlights

- The substrate competition among multiple VFAs is described by this metabolic model
- Factor K_{-i} is used to describe the inhibition effect when multiple VFAs are present
- Good agreement is achieved between the model and experimental measurements
- This model can be used to predict the uptake of multiple VFAs and PHA composition

Abstract

Mixed microbial cultures (MMCs) are an effective method for polyhydroxyalkanoates (PHA) production. There are several models established to describe the metabolism of this process. Substrate competition was commonly found in the uptake of multiple volatile fatty acids (VFAs), thus this behavior should be considered in process modeling. In this study, a metabolic model is developed to describe for the first time