



Production of PHAs with enhanced properties from sugar-based wastewater in a two stage process

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ABSTRACT

The experimental design of the study was based on two different microbial processes, i.e. anaerobic fermentation of a sugar-based wastewater via mixed acidogenic cultures and aerobic polymerization of the produced acids and alcohols for poly-hydroxy-alkanoates (PHAs) production, via enriched cultures. For the first stage of the combined process, a continuous stirred tank reactor (CSTR) was developed operating at mesophilic conditions, using as inoculum the indigenous microbial culture contained in the wastewater. For the optimization of the reactor performance, the effect of main parameters influencing the distribution of the produced acids were investigated.

The liquid effluent of the reactors, containing fatty acids and ethanol were forwarded to the second stage of the combined process. A drawn and fill reactor was used for the second, aerobic stage of PHAs production. The inoculum used for the start up of the reactor was an enriched culture that was developed by thermally pretreated soil, subjected to nutrient limitation.

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