Temperature dependent kinetics of ethanol fermentation by self- aggregating yeast

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ABSTRACT

Kinetics of ethanol fermentation using self-aggregating Saccharomyces uvarum U4, that forms stable aggregates (about 3mm in diameter), over temperature range of 25-43°C. Significant substrate inhibition was observed when sugar concentration was higher than 300 g/L, and the substrate inhibition constant was not strongly affected by temperature. The maximum ethanol concentration, for ethanol production, was found to decrease with increasing temperature. Similar pattern was observed for growth kinetics.Optimal temperatures for growth and fermentation were found to be in the neighborrhood of 35°C. The effectiveness factor of the aggregates was found to be strongly dependent on sugar concentration and temperature. The fermentation kinetic model and growth kinetic model were coupled and integrated, and was found to be in good agreement with experimental data over the temperature range studied.

Keywords : Self-aggregation Yeast ; Ethanol Fermentation ; Temperature

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