

Cybernetic Modeling of Simultaneous Saccharification and Fermentation for Ethanol Production from Steam-exploded Wood with *Brettanomyces custersii*

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Simultaneous saccharification and fermentation (SSF) process consists of the enzymatic saccharification and fermentation simultaneously. This study combined saccharification based on modified Michaelis-Menten kinetics and enzyme inhibition kinetics with fermentation based on the Monod equation and cybernetic model. The cybernetic modeling using *Brettanomyces custersii* identified as a glucose- and cellobiose-fermenting yeast was suitable for describing the sequential growth on multiple substrates. The proposed model improved the previous SSF kinetic model, and testified the validity of the cybernetic model for correlating with previous experimental results.