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Kinetic Study on Transfructosylation by β -Fructofuranosidase from *Aspergillus niger* ATCC 20611 and Availability of a Membrane Reactor for Fructooligosaccharide Production

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Transfructosylation catalyzed by fructooligosaccharide-producing β -fructofuranosidase from *Aspergillus niger* ATCC 20611 was kinetically studied and a reaction model of transfructosylation was proposed. Kinetic parameters (V_m , K_m , and K_i) were determined from experimental data on the transfructosylation rates at various substrate concentrations with and without addition of glucose. Transfructosylation reaction was found to be inhibited non-competitively ($K_i=0.12 \text{ mol l}^{-1}$) by glucose. Simulation results in sugar composition due to the action of a β -fructofuranosidase were in good agreement with the experimental data. In order to get higher reaction conversion with a simultaneous removal of glucose, a membrane reactor system was developed using nano-filtration membrane, through which glucose permeated but sucrose and fructooligosaccharides did not permeate. Fructooligosaccharide percentage of the reaction product was increased to above 90%, which was much higher than that of the batch reaction product (55–60%) and comparable to that of the chromatography processed product. The membrane reactor system will be applicable for production of fructooligosaccharides.

Keywords: [fructooligosaccharides](#), [transfructosylation](#), [membrane reactor](#), [kinetics](#)

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