Thesis Title	A Study of Mass Transfer in Plant Materials
Thesis Credits	12
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Degree of Study	Master of Engineering
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Academic	1999

Abstract

This thesis investigated the mechanisms and the phenomena of mass transfer in vascular plant materials. The effects of vascular structure and initial solute concentration were also studied. Bamboo shoots, pine apple cores and carrots were used as plant materials, and glucose solution was chosen as feed in perstraction cell. The mass transfer rate of glucose was detected by periodical monitoring the glucose concentration which accreted in receiving chamber. The initial flux was large then rapidly decreased and steadily declined until the steady state was reached. This could be explained as the results of fouling and counter flow of water, The former phenomenon was established either in the area of vascular tube and parenchyma. However it was not clear that which one was the main effect for the flux initially declined. While the latter was caused by the difference in osmotic pressure.

The differences in length, straight, porosity and density of vascular tube in plant materials contributed the difference in initial flux but was not responsible for the flux decline. The glucose transfer rate did not vary linearly with glucose concentrations. This might be that the fouling phenomenon mainly affected the mass transfer process in plant materials.

Keywords : Mechanism and Phenomena of Mass Transfer / Plant Material / Vascular Structure / Fouling