

Continuous recycle membrane reactor for enzymatic hydrolysis of dual modified potato starch

Joanna Sulej-Chojnacka*, Emilia Konował, Krystyna Prochaska

*^aInstitute of Chemical Technology and Engineering, Poznan University of Technology,
pl M. Skłodowskiej-Curie 2, 60-965 Poznan, Poland
Tel. +48 (061) 6653601; Fax +48 (061) 6652852; email: joanna.sulej@op.pl, krystyna.prochaska@put.poznan.pl*

Received 12 July 2009; Accepted 29 December 2009

ABSTRACT

The chemically modified starches, and their hydrolysates were developed with broad application in the food, paper and textile industries because of their capacities for emulsifying various colloidal emulsions. One of the methods of making starch hydrolysates is conducting an enzymatic reaction in a continuous recycle membrane reactor (CRMR). The introduction of the membrane reactor makes it possible to conduct the enzymatic hydrolysis process more economically by reuse of enzymes to increase the reaction yield, shorten the reaction time and reduce costs. The aim of the present research was selection of optimal work conditions for enzymatic hydrolysis of dual modified potato starch in a CRMR with an outer ultrafiltration (UF) module (CRMR). Two different variants of courses of the hydrolysis process were investigated. Materials for investigations were dual modified potato starches (by oxidation and acetylation), with the various content of acetyl groups. BAN 480 L, which contains amylase of bacterial origin, was used as an enzymatic preparation. The measure of hydrolysis productivity was a change of dry substance (DS) in the filtrate fraction, while the measure of its efficiency was the obtained degree equivalent (DE) of hydrolyzed derivative.

Keywords: Enzymatic hydrolysis; Dual modified starches; Continuous recycle membrane reactor; Fouling

* Corresponding author.