



## The influence of types of dual modified starches on the enzymatic hydrolysis in the continuous recycle membrane reactor

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### ABSTRACT

The aim of work was to study the influence of the degree of substitution of acetylated oxidized starch (E-1451) on the process of enzymatic hydrolysis in a continuous recycle membrane reactor (CRMR). Three kinds of E-1451 starch preparations with different degrees of carboxyl group substitution (0.04, 0.11 and 0.5%) and with different degrees of acetylation: 0.5% and 2.5% (3%) were examined. The waxy corn modified starch was also investigated. Hydrolyses were performed in the CRMR equipped with an ultrafiltration module containing a ceramic membrane of tubular configuration. The membranes used were characterised by the following parameters: a length of 0.3 m, external diameter of 10 mm, three channels and a molecular weight cut-off of 50, 15 or 8 kDa. During the process the UF module was working in three variants: with a membrane of 15 kDa or a set of two membranes: 50/15 kDa and 15/8 kDa. The hydrolysis process was performed over a period of 150 min at a temperature of 60°C, at the transmembrane pressure of 0.5 MPa and with a 0.3 ml of enzyme preparation BAN 480 L per 1 kg of dry starch. It was stated that the efficiency of the separation process as well as the effectiveness of hydrolysis process was affected by the type of modification and the degree of substitution of starch.

*Keywords:* Membrane reactor; Membrane fouling; Membrane permeability; Enzymatic hydrolysis

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