CHALLENGES IN THE DETERMINATION OF THE SUBSTITUENT DISTRIBUTION OF CARBOXYMETHYL GLUCANS BY CE-UV

F. Sydow*, W. Stelter, P. Mischnick

Technische Universität Braunschweig, Institute of Food Chemistry, Schleinitzstr. 20, D-38106 Braunschweig, Germany

f.sydow@tu-braunschweig.de

Carboxymethyl glucans like carboxymethyl cellulose (CMC) are used in a wide range of applications (e.g. pharmaceuticals, detergents, food). Beside molecular weight and average degree of substitution, their properties depend on the distribution of the substituents in the glucosyl unit and over the polymer backbone.

A CE-UV method for determining the substitution pattern in carboxymethyl glucans on the monomer level applying borate buffer has been established [1]. For the analysis of the carboxymethyl distribution along and over the chain, the cellulose ether is degraded to oligomers. These oligomer fractions need to be analyzed with respect to the number of CM groups in all constituents of a certain degree of polymerization (DP). Thus, the challenge is to avoid the separation of the high number of regioisomers which would make peak assignment and evaluation of DS/DP profiles impossible. Therefore, the Influence of buffer system, pH-, ionic strength and temperature on the separation is studied. Irreversible migration time shifts observed at acidic pH-values, and peak splitting occurring with consecutive injections are discussed.

For a similar analytical problem, the separation of the methyl-esterified and non-esterified galacturonic acid oligomers derived from pectins, a CE-UV method has been reported by Williams *et al* [2]. They have been successful using phosphate buffer at pH 7. Applying this buffer system to our CM-1,4-glucooligosaccharides provided a suitable separation of model substances. The results of these measurements are presented.

References

[1] W. Lazik, Th. Heinze, K. Pfeiffer, G. Albrecht, B., P. Mischnick, J Appl Polym Sci (**2002)** 86, 743–752.

[2] M. A. K. Williams, G. M. C. Buffet, T. J. Foster, Anal Biochem (**2002)** 301, 117–122.