Synthesis of monosubstituted derivatives of cyclodextrins

Abstract

This thesis is focused on a preparation of a set of exactly defined monosubstituted derivatives of α-CD for subsequent utilization in organic synthesis. Cinnamyl or allyl group is very suitable for the preparation of monosubstituted derivatives of CD, because these groups contain nonaromatic double bond, which can be widely modified. Peracetylated 2^{I}-*O*-, 3^{I}-*O*-, and 6^{I}-*O*-allyl and 2^{I}-*O*- and 3^{I}-*O*-cinnamyl derivatives of α-CD mentioned in this thesis were prepared in yields 3.7 – 13 %. Position of allyl and cinnamyl group was determined by 2D NMR techniques. Possibility of derivatization of allyl and cinnamyl derivatives was exemplified by transformation of peracetylated 2^{I}-*O*-, and 6^{I}-*O*-allyl and 3^{I}-*O*-cinanmyl derivatives to peracetylated 2^{I}-*O*-, 3^{I}-*O*-, and 6^{I}-*O*-formylmethyl derivatives via reductive ozonolysis. These aldehydes were oxidized by Jones reagent to 2^{I}-*O*-, 3^{I}-*O*-, and 6^{I}-*O*-carboxymethyl derivatives.

Keywords: cyclodextrins, monosubstitution, allyl, cinnamyl, formylmethyl, carboxymethyl