

Regioselective reduction of keto groups in Michael adduct levoglucosenone and cyclohexanone

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Abstract

Michael adducts of levoglucosenone and cycloalkanones are convenient chiral compounds for the synthesis of various biologically active compounds due to the presence of 2 reactive keto groups, a latent aldehyde and *vic*-diol functions. The reaction of the opening of the 1,6-anhydro bridge by the action of HCl-MeOH allowed to develop a scheme for the synthesis of medium and large chiral lactones based on the Michael adducts obtained. Methods of selective reduction of the acetal center by the action of TMSCl-NaI have been found on the basis of the adduct levoglucosenone and cyclohexanone and reactions of intramolecular aldol condensation have been studied. Methods of differentiation of keto groups in Michael adducts of levoglucosenone and cyclohexanone have been developed, which flow regioselectively on the ketogroup of carbohydrate residue: formation of ketal, Wittig-Cory reaction gives dichloromethylene derivative; Kori-Tchaikovsky reaction occurs by education of epoxy. In this article, we report the methods of regioselective reduction of keto groups in Michael adducts of levoglucosenone and cyclohexanone. We found that during the reduction of diastereomeric Michael adducts NaBH₄ and Red-Al were active, but not selective reducing reagents. NH₂Li and NaBH(OAc)₃ exhibited high regioselectivity towards the keto groups of the cyclohexanone fragment and carbohydrate residue, respectively. The latter and microbiological methods using *Saccharomyces cerevisiae* show similar regiochemical results for the reduction of keto groups in adducts.

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