Synthesis of the modified receptors for cations based on penta-O-benzylsucrose

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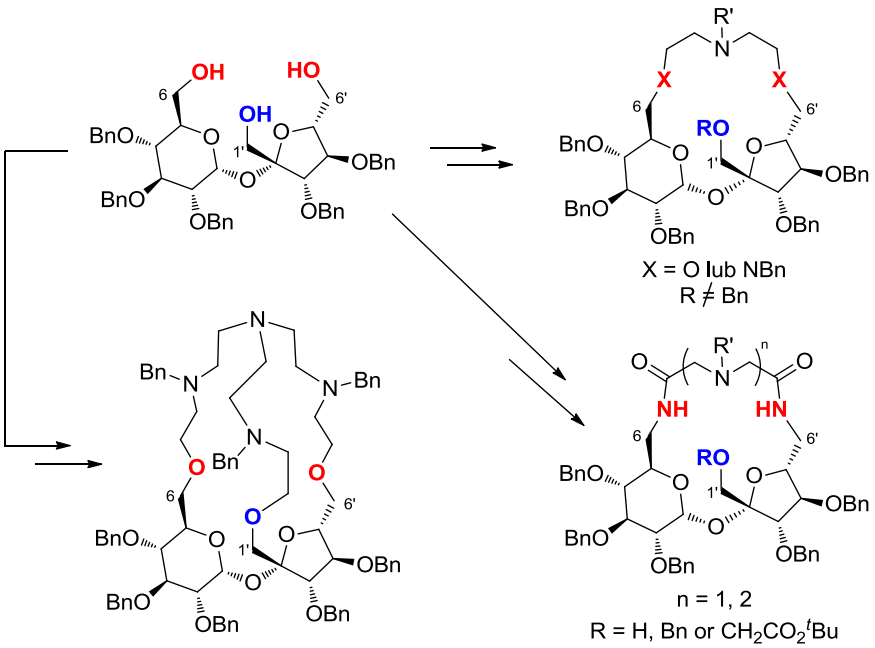
The main goal of this Ph.D. dissertation was the synthesis of macrocyclic compounds derived from 2,3,3',4,4'-penta-*O*-benzylsucrose and testing their complexing properties towards both enantiomers of 1-phenylethylammonium hydrochloride.



During laboratory works, eight new methods of highly selective functionalization of the terminal hydroxyl groups in 2,3,3',4,4'-penta-O-benzylsucrose and 2,3,3'4,4'-penta-*O*-benzyl-6-*O*-*tert*-butyl-diphenylsilylsucrose were elaborated. Alkylation reactions could be easily controlled by two factors: amount of alkylating agent and time; this allowed to prepare the mono- (at the C-6 positions) or di-alkylated (at the C-6 and C-1' positions) derivatives.

Four highly functionalized derivatives were applied in the synthesis of aza-crown and bis-amide analogues containing substituent another than benzyl group at position C-1'. Then, they were tested in complexation of both enantiomers of 1-phenylethylamonium hydrochloride by the NMR experiments. It was found that two macrocyclic derivatives with sucrose scaffold were able to selectively recognize only 1-(*S*)-phenylethylammonium hydrochloride.

Finally, three synthetic methods of the preparation of the cryptand-like systems with sucrose subunit were elaborated. These new compounds are the first examples of such type sucrose-based derivatives.