

Synthesis of urea and thiourea sucrose derivatives and the study of their ability to complex anions

mgr Katarzyna Łęczycka-Wilk

Supervisor: prof. dr hab. Sławomir Jarosz

The main purpose of this Ph.D. dissertation was the synthesis of macrocyclic sucrose derivatives containing a urea or thiourea moiety and testing the complexing properties towards anions.

The literature review is divided into two parts. First one provided basic information about sucrose, as well as selective transformations of the individual hydroxyl groups. The second part describes the methods of the preparation of macrocyclic derivatives containing at least two molecules of a disaccharide (sucrose, lactose and trehalose).

The results obtained during laboratory work are presented in the separate part. The method of the preparation of 6,6'-diamino-6,6'-dideoxy-1',2,3,3',4'-hexa-*O*-benzylsucrose is discussed at the beginning of this chapter. Next, the synthesis of macrocyclic sucrose derivatives with urea and thiourea moiety are presented. Conformational analysis of the obtained derivatives were discussed with confirmation of structures by NMR spectroscopy. In addition, associative constants of individual macrocyclic compounds were calculated based on experimental data.

The experimental part describes detailed procedures of the preparation of new macrocyclic sucrose derivatives with full sets of analytical data. NMR / UV-Vis titration experiments were discussed and crystallographic data for one of the compounds was reported. Finally, structures of the urea derivatives obtained by calculation methods are presented.