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Synthesis of aza-crown analogues and macrocyclic bis-lactams with sucrose scaffold

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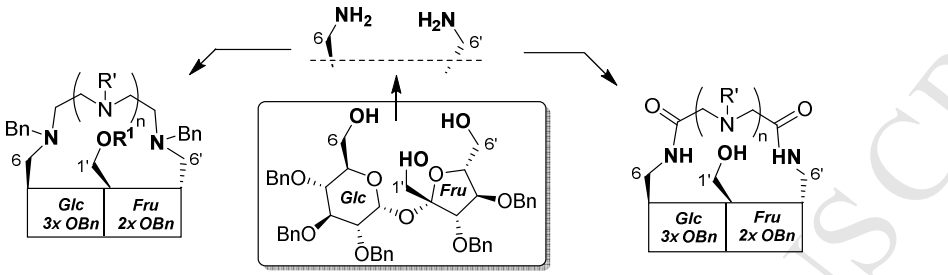
dedicated to Professor Marek Chmielewski on the occasion of his 75th birthday



Abstract: 2,3,3',4,4'-Penta-*O*-benzylsucrose was converted into the corresponding diaminoalcohol which was used as a key building block in the synthesis of the analogues of aza-crown ethers and bis-lactams.

Key words: sucrose, selective functionalization, aza-crown ether analogues, macrocyclic bis-lactams.

1. Introduction

Macrocyclic compounds containing the nitrogen functionalities are important targets in supramolecular chemistry [1]. Such compounds usually exhibit very interesting complexing properties. One of the most significant challenges is the enantioselective recognition of the guests which is possible when achiral subunit is incorporated in the macrocyclic structure. Carbohydrates seem to be especially useful and perspective platforms for the construction of macrocyclic receptors in optically pure form [2,3]. Simple sugars are readily available in a variety of diastereoisomeric forms, which allows preparing a large number of ~~the~~ receptors differing in geometry. Such diversity of ~~the~~ structures strongly influences the ability of the enantioselective complexation.

Up to date mostly monosaccharides are used as sugar platforms for crown- and aza-crown receptors; application of disaccharides is much less common [2,3,4].

Chiral lactams – especially macrocyclic – are also interesting targets, since they are responsible for enantioselective recognition of chiral anions [5,6]. There are a number of