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ORIGINAL ARTICLE

Cesium cation templated selective synthesis of a ''cone-shaped'' sugar macrotricyclic cryptand: A dual anion-cation molecular recognition of potassium tartrate

Synthèse sélective assistée par matrice de cations Césium d'un nouveau cryptant macrotricyclique : double reconnaissance cation-anion du tartrate de potassium

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Staudinger-Aza-Wittig reaction

Summary Cesium templated Staudinger-aza-Wittig tandem reaction (S.A.W.) has been used in the synthesis of a bis-diazacrown-bis-cellobiosyl-tetra-ureido cryptand. A novel macrotricyclic compound having a ''cone-shaped'' configuration was selectively obtained. Additionally, first results on potential recognition properties of the cryptand are also given.

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MOTS CLÉS
Cryptants ;
Synthèse assistée par matrice ;
Carbohydrates ;
Ethers couronnes ;
Réaction de Staudinger-Aza-Wittig

Résumé Une réaction tandem de Staudinger-Aza-Wittig (SAW) assistée par matrice à l'aide de cations Césium a été mise en œuvre pour la synthèse d'un cryptant tetra-ureido-bis-cellobiosyl-bis—ether-couronne. Ce nouveau composé macrotricyclique chiral possède une structure tronconique obtenue sélectivement par la réaction. Des premiers résultats sur son potentiel de reconnaissance vis-à-vis de molécules invitées sont également décrits.

Introduction

A limited number of papers in literature relate the synthesis of cryptands associating in their structures carbohydrate moieties and azacrown ethers [1—5]. In a recent communication [6] we described an efficient sodium/cesium templated ''one-pot'' synthesis of a new family of macrobicyclic **A** and macrotricyclic **B** or **C** compounds (Fig. 1). It was demonstrated at this occasion that a high selectivity occurs in the presence of sodium or cesium alkali cations and that the macrocyclisation step was entirely under the cation size control. Nevertheless, considering the reaction and the mechanism [6—8] two nucleophilic additions took place simultaneously on the diisocyanate intermediate by the pre-organised sodium or cesium diaza-coronates. Thus, one should note that the cyclisation reaction with cesium can theoretically produce two different macrocycles, one **C** with the two disaccharides in parallel direction (Fig. 1) and the other one **B** with two disaccharides in an anti-parallel direction. Unfortunately, a crystal structure of the formers was lacking so far; it was then impossible to assign by NMR which one was the anti-parallel or ''cone-shaped'' configuration obtained by the ''one-pot'' templated procedure.

Materials and methods

General

All the new compounds gave satisfactory spectroscopic data. ^{1}H and ^{13}C NMR spectra were recorded on Bruker DRX-400 spectrometer, FTIR spectra on a Bruker Vector22

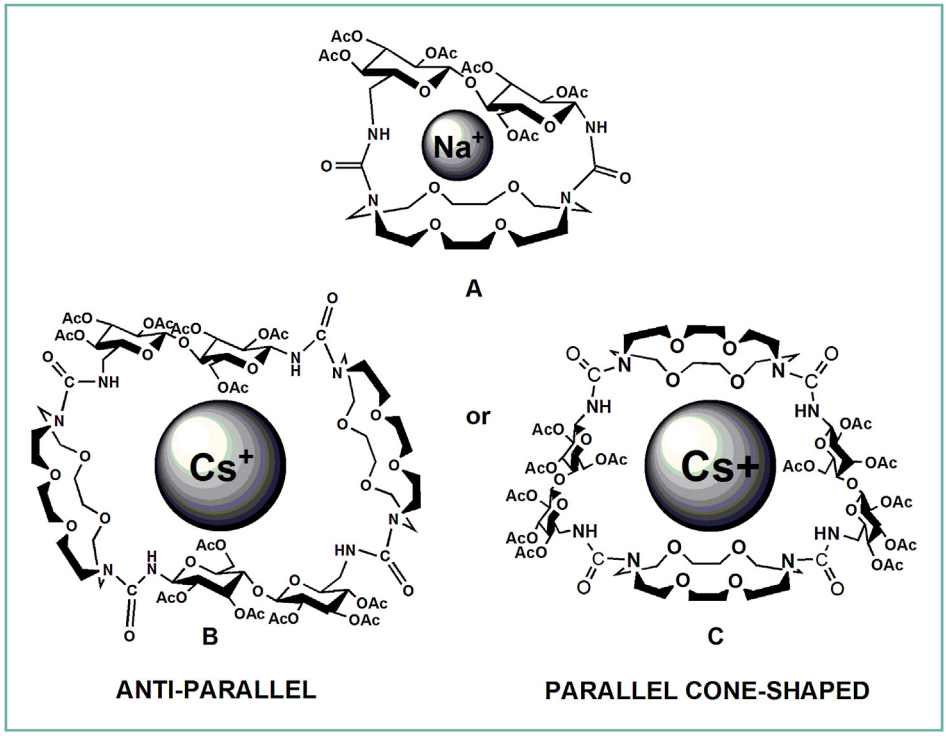

Figure 1. A new family of macrobicyclic **A** and macrotricyclic **B** or **C** compounds.
Une nouvelle famille de composés macrobicyclique et macrotricycliques **A**, **B** *ou* **C**.