

From 2+2 to 8+8 condensation products of diamine and dialdehyde : giant container-shaped macrocycles for multiple anion binding.

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Rok wydania

2016

Czasopismo

Journal of Organic Chemistry

Numer woluminu

81

Strony

5285-5294

DOI

10.1021/acs.joc.6b00531

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The combination of 2,6-diformylpyridine and trans-1,2-diaminocyclopentane fragments results in 2 + 2, 3 + 3, 4 + 4, 6 + 6, and 8 + 8 macrocyclic imine condensation products. These imines can be reduced to the corresponding 2 + 2, 3 + 3, 4 + 4, 6 + 6, and 8 + 8 macrocyclic amines. The X-ray crystal structures of their protonated derivatives show a rich variety of macrocycle conformations ranging from a stepped 2 + 2 macrocycle to a multiply folded 8 + 8 macrocycle of globular shape. These compounds bind anions via hydrogen bonds: two chloride anions are bound above and below the macrocyclic ring of the 2 + 2 amine, one chloride anion is bound approximately in the center of the 3 + 3 macrocycle, and two chloride anions are deeply buried inside a folded container-shaped 4 + 4 macrocycle, while in the case of the previously reported 6 + 6 amine four chloride anions and two solvent molecules are buried inside a container-shaped macrocycle. Yet another situation was observed for a multiply folded protonated 8 + 8 macrocycle which binds six sulfate anions; two of them are deeply buried inside the container structure while four anions interact with the clefts at the surface of the container.

Adres publiczny

<http://dx.doi.org/10.1021/acs.joc.6b00531>

Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>