

Conformation-dependent response to the protonation of diphenanthriooctaphyrin(1.1.1.0.1.1.1.0): a route to pseudorotaxane-like structures.

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Rok wydania

2020

Czasopismo

Chemistry-A European
Journal

Numer woluminu

26

Strony

8555-8566

DOI

10.1002/chem.202000940

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Diphenanthriooctaphyrin(1.1.1.0.1.1.1.0), an expanded carbaporphyrinoid incorporating two phenanthrenylene moieties, exists as two separate, yet interconvertible, locked stereoisomers. These species demonstrate complex dynamic behavior upon protonation, consisting in multiple conformational rearrangements and anion-binding events. The formation of one of the final dicationic forms is accompanied by the inclusion of a complex anion(s) within the macrocyclic cavity yielding a pseudorotaxane-like host-guest complex. Protonation with trifluoroacetic or dichloroacetic acids followed by neutralization afforded a conformation-switching cycle, which involves six structurally different species. Analogous acidification with chiral 10-camphorsulfonic acid and subsequent neutralization generated one of the free base stereoisomers with enantiomeric excess. Therefore, it was shown that the simple acid-base chemistry of diphenanthriooctaphyrin can act as stimulus, inducing chirality into the system, allowing for the manipulation of the stereochemical information imprinted into the enantiomers of the macrocycle.

Słowa kluczowe

anion binding, chirality, conformational equilibria, porphyrinoids, pseudorotaxanes

Adres publiczny

<http://dx.doi.org/10.1002/chem.202000940>

Strona internetowa wydawcy

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