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Cascade and commutative self-assemblies of nanoscale three-component systems controlled by the conformation of thiacalix[4]arene

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Abstract

In this work, the formation of two- and three-component supramolecular systems based on cone, partial cone, 1,3-alternate stereoisomers of heteroditopic "hosts": p-ter-butylthiacalix[4]arene containing 4-amidopyridine fragments with silver(I) cations and dicarboxylic acids in liquid and solid phases were studied by UV spectroscopy, dynamic light scattering, and atomic force microscopy methods. It has been shown that these macrocycles are coreceptors, capable of simultaneously binding silver(I) cations, dicarboxylic acids (oxalic, malonic, succinic, maleic, fumaric acids), and hydroxyl acids (glycol, tartaric acids). For the first time, by the dynamic light scattering method, it has been shown that the conformation of p-ter-butyl thiacalix[4]arenes significantly affects the type of three-component system formed: cone is characterized by the formation of cascade systems; for partial cone, intermediate systems; and for the 1,3-alternate stereoisomers, three types of three-component systems (cascade, intermediate, and commutative) were observed. © 2011 American Chemical Society.

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