

Heteroditopic p-tert-butyl thiacalix[4]arenes for creating supramolecular self-assembles by cascade or commutative mechanisms

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Abstract

New p-tert-butylthiacalix[4]arenes functionalized with hydrazides of nicotinic, isonicotinic, 3-nitrobenzoic acids, 2-hydrazinopyridine, phenylhydrazine, benzotriazole groups at the lower rim in cone, partial cone and 1,3-alternate conformation have been synthesized. The mechanism of self-assembly of supramolecular nanosized particles based on functionalized p-tert-butylthiacalix[4]arenes with silver nitrate and or dicarboxylic acids (oxalic, malonic, succinic acid) has been determined by dynamic light scattering. For the first time, it has been shown that nanoscale particles based on p-tert-butylthiacalix[4]arenes, capable of recognizing metal cations and dicarboxylic acids can form cascade or commutative three-component supramolecular systems. Also for the first time, it has been shown that p-tert-butylthiacalix[4]arenes containing N-substituted hydrazide and heterocyclic fragments are coreceptors, capable of simultaneously binding silver (I) cations and dicarboxylic acids. The formation of cascade systems: "macrocycle-silver (I) nitrate-dicarboxylic acid" is a characteristic of p-tert-butyl thiacalix[4]arenes containing N-substituted hydrazide fragments. © 2012 The Royal Society of Chemistry.

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