

Journal of Physical Chemistry C 2009 vol.113 N36, pages 15838-15844

Self-assembly of stereoisomers of p-tert-butyl thiacalix[4]arenes tetrasubstituted at the lower rim by a tertiary amide group with cations of p- and d-elements in the organic phase

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Abstract

The ability of p-tert-butyl thiacalix[4]arenes tetrasubstituted at the lower rim by morpholide and pyrrolidide groups in cone, partial cone, and 1,3-alternate conformations to recognize cations of p- (Al^{3+} , Pb^{2+}) and d- (Fe^{3+} , Co^{3+} , Ni^{2+} , Cu^{2+} , Cd^{2+} , Hg^{2+}) elements has been studied by the picrate extraction method, dynamic light scattering (DLS), and atomic force microscopy (AFM). The hydrodynamic diameters of supramolecular associates, polydispersity index of host-guest systems, and molecular weight of nanoscale aggregates consisting of p-tert-butyl thiacalix[4]arenes and metal nitrates have been determined by the correlation spectroscopy method. It was shown that the investigated macrocycles are effective extractants for metal cations. All the investigated thiacalix[4]arenes are able to form dimers of about 1 nm with metal cations and nanoscale particles of 238 and 212 nm with Ni^{2+} and Pb^{2+} cations, respectively. © 2009 American Chemical Society.

<http://dx.doi.org/10.1021/jp902904n>
