

# Configuration effect of the tert-butylthiacalix[4]arene tetracarboxy derivative on its receptor properties toward vaporous organic compounds

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## Abstract

The effect of carboxy groups and the stable conformation of tert-butylcalix[4]arenes containing four carboxymethoxy substituents at the lower rim on their receptor properties toward organic substances and water was studied for the systems with guest vapor and solid host. For this purpose, the compositions of clathrates formed in these systems, their thermal stability, and parameters of the host-guest affinity were determined by the quartz microbalance method, thermogravimetry, thermogravimetry combined with differential scanning calorimetry and mass spectrometry, and static headspace gas chromatography. The introduction of four carboxymethoxy groups into tert-butylthiacalix[4]arene enhances its receptor capacity and affinity to water and aliphatic alcohols and decreases the thermal stability of the most part of the studied clathrates with hydrophobic guests except benzene. The studied tert-butylthiacalix[4]arene derivatives can be promising receptors for use in mass-sensitive sensors of the quartz microbalance type to methanol and ethanol vapors. © 2009 Springer Science+Business Media, Inc.

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## Keywords

Clathrates, Differential scanning calorimetry, Headspace gas chromatography, Host-guest inclusion compounds, Piezoelectric sensors, Sorption isotherms, Thermogravimetry, Thiacalix[4]arenes