

Self-assembled lanthanide salicylaldimines with a unique coordination mode.

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Streszczenie

New lanthanide salicylaldimine complexes of the formula $[Ln(H_2L)_3(NO_3)_3](H_2L)$, where $Ln = La^{3+}$ (**1**), Nd^{3+} (**2**), Eu^{3+} (**3**), Gd^{3+} (**4**), Ho^{3+} (**5**), Er^{3+} (**6**), Tb^{3+} (**7**) or Yb^{3+} (**8**), and $H_2L = N,N'$ -bis(salicylidene)-4-methyl-1,3-phenylenediamine, were formed in a self-assembly process involving the lanthanide template-induced one-step [2+1] Schiff base condensation reaction between salicylaldehyde and 4-methyl-1,3-phenylenediamine. The unusual coordination pattern of salen-type ligands in these complexes, in which the three potentially tetradentate N_2O_2 salicylaldimines function as undeprotonated, monodentate, exclusively O-donor ligands without involving the nitrogen atoms in the coordination environment, was proved by single-crystal X-ray diffraction analysis and correlated with spectroscopic characterization. In this species with the nine-coordinate distorted tricapped trigonal prism geometry, the nitrates act as bidentate chelators occupying six coordination sites and leaving the remaining sites available for salicylaldimine ligands formed in situ in the template process. The additional salicylaldimine molecule acts as a guest for the salicylaldimine complex host and stabilizes the overall self-assembled supramolecular network.

Słowa kluczowe

self-assembly, lanthanides, Schiff-base, O ligands,
Coordination modes

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