Pentaaza macrocyclic ytterbium(III) complex and solvent controlled supramolecular self-assembly of its dimeric μ-η^2:η^2 peroxo-bridged derivatives.

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Streszczenie

The unprecedented template action of ytterbium ion in the synthesis of pentaaza macrocyclic Schiff bases is exemplified by isolation and definitive identification of the seven-coordinate pentagonal bipyramidal complex with the formula of $[YbLCl_2]ClO_4$ (**1**), where L is 2,14-dimethyl-3,6,10,13,19-pentaazabicyclo[13.3.1]nonadeca-1(19),2,13,15,17-pentaene, providing the first example of crystallographically characterized pentaaza macrocyclic ytterbium complex. For the first time the spectrum of the $^2F_{7/2} \rightarrow {}^2F_{5/2}$ transition has been obtained for a molecular complex of ytterbium with organic ligands in which all ligand-field components of the ground and excited state are well displayed at room temperature. This complex is capable of forming a dimeric peroxo $Yb_2(\mu\text{-}\eta^2\text{:}\eta^2\text{-}O_2)L_2^{4+}$ (**2**) derivative containing the biologically significant planar side-on doubly bidentate coordination mode of the peroxide. Inclusion of the appropriate solvent molecule into the crystal structure generates supramolecular architectures (**2a–d**) in which the solvent controlled self-assembly is observed. Spectral properties of these complexes were found to be very important and promising in the area of ytterbium physicochemistry.

Adres publiczny

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