

Chiral macrocyclic La(III), Ce(III), Pr(III) and Eu(III) complexes with chloride anions.

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Streszczenie

The new enantiopure macrocyclic complexes $[\text{LnL}]\text{Cl}_3 \cdot n\text{H}_2\text{O}$ or their racemic mixtures $[\text{LnracL}]\text{Cl}_3 \cdot n\text{H}_2\text{O}$ ($\text{Ln}=\text{La}^{+3}$, Ce^{+3} , Pr^{+3} and Eu^{+3}) have been synthesised in a template condensation of *trans*-1,2-diaminocyclohexane and 2,6-diformylpyridine. The complexes have been studied by ^1H and ^{13}C NMR spectroscopy. The signal assignment was based on the COSY, NOESY and HMQC measurements. The X-ray crystal structure of $[\text{LaracL}]\text{Cl}_3$ complex has been determined. The lanthanum ion in this complex is coordinated by six nitrogen atoms of the macrocyclic ligand and three chloride anions. The macrocycle exhibits a twist-bent conformation of approximate C_2 symmetry. On the other hand, NMR spectra of the investigated compounds in methanol-chloroform solution indicate effective D_2 -symmetry that results from the fast dynamic exchange of chloride anions. New La(III), Ce(III), Pr(III) and Eu(III) macrocyclic complexes were obtained in a template 2+2 condensation of *R,R'*-1,2-diaminocyclohexane and 2,6-diformylpyridine in the presence of the appropriate lanthanide chloride salts. The ^1H and ^{13}C NMR spectra of these paramagnetic complexes were assigned on the basis of COSY, NOESY and HMQC measurements. The analysis of NMR spectra reveals dynamic exchange of the coordinated chloride anions. The single-crystal X-ray structure of the La(III) complex show the twist-bent conformation of the macrocyclic ligand.

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