Structural effect of ligand chirality and its spetroscopic consequence.

Autorzy

Janina Legendziewicz

Zbigniew Ciunik

Paula Gawryszewska

Jerzy Sokolnicki

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Streszczenie

Two series of pure and diluted lanthanide crystals with l and dl-isoleucine of formula $[Ln(Ile)_2(H_2O)_4]_2(ClO_4)_6$ (Ln=Eu, Nd) isomorphic for Eu and Nd ions were synthesised. The europium complex with l-isoleucine (**1**) and the neodymium one with the dl form (**2**) have been studied by single-crystal X-ray diffraction. The space groups are monoclinic C2 and triclinic $P\bar{1}$ for l and dl isoleucine, respectively, and Z=2 and 1. The crystal structures consist of non-centrosymmetric and centrosymmetric dimer units for the l and dl ligand forms, respectively. Thus, the structural effect of ligand chirality was found and its spectroscopic consequences are reported. An attempt has been made to show the relation between the symmetry of the dimeric units and splitting of the electronic transitions. Well resolved absorption spectra down to 5 K are measured. Concentration effects on the intensities of electronic transition are examined. The vibronic coupling and cooperative interaction are analysed and confronted for complexes with l-handed and racemic ligand form. Following the vibrational analysis of the Raman spectra the assignment of $[Nd(Ile)_2(H_2O)_4]_2(ClO_4)_6$ vibronics are given. The nature of observed phenomena is briefly discussed.

Słowa kluczowe

Spectroscopy, X-ray, Cooperative interaction, Chirality effect, Lanthanides, Isoleucine

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