Electronic energy-level structure of $4f^6$ configuration in europium(III) triacetate tetrahydrate.

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2008

Czasopismo

Chemical Physics

Numer woluminu

354

Strony

86-93

DOI

10.1016/j.chemphys.2008.09.008

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Analysis of high-resolution absorption and emission spectra of europium(III) triacetate tetrahydrate (EuAC) crystal enabled assignment of 130 experimental crystal-field levels of the $4f^6$ configuration between 0 and 35,050 cm^{-1}. These experimentally determined levels were simulated using a semi-empirical 35 parameters Hamiltonian representing the combined free-ion and crystal-field interactions for Eu^{3+} ion in the C_1 symmetry site, with the final relatively low r.m.s. deviation of 9.0 cm^{-1}. The reliable starting values of parameters were obtained from the superposition model analysis. The crystal-field strength (S_{cf}) for EuAC is slightly smaller than for europium(III) trioxydiacetate complex (EuODA). It is probably brought about by the presence of two water molecules in the first coordination sphere of the metal ion in the acetate crystal.

Słowa kluczowe

Europium(III), Acetate, Crystal field

Adres publiczny

https://doi.org/10.1016/j.chemphys.2008.09.008

Strona internetowa wydawcy

http://www.elsevier.com