Uniwersytet Wrocławski

Repozytorium

Plik pochodzi z repozytorium Wydziału Chemii Uniwersytetu Wrocławskiego

Spectral characteristic and crystal-field calculations for new Er(III) phosphor of the type $[Er(SP)_4]^-$ (where $SP=C_6H_5S(O)_2NP(O)(OCH_3)_2^-$).

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Rok wydania

2016

Czasopismo

Journal of Luminescence

Numer woluminu

169

Strony

777-781

DOI

10.1016/j.jlumin.2015.03.029

Kolekcja

Naukowa

Język

Angielski

Streszczenie

The studies of lanthanide β-diketones and their derivatives have been greatly intensified because of their potential use in photonic devices. In this work the results of spectroscopic properties of a new erbium phosphor are presented. Optical characteristics of the title chelate was based on absorption and emission spectroscopy. The crystal-field calculation using phenomenological model was performed basing on Stark components from absorption and emission low temperature spectra. The CF and CCF parameters for Nd(III) (D. Kulesza, M. Sobczyk, J. Legendziewicz, O.M. Moroz, V.M. Amirkhanov, Struct. Chem., 21 (2010) 425) have been applied as starting points in the fitting procedures for $[Er(SP)_4]^-$. $Na[Er(SP)_4]$ and $Na[Nd(SP)_4]$ are isostructural and crystallize in the monoclinic system (space group $P2_1/c$). The crystal lattice consists of two independent polymeric chains with the same kind of coordination of Er and Na ions.

Słowa kluczowe

Erbium ion, absorption and emission spectra, Crystal-field analysis

Adres publiczny

http://dx.doi.org/10.1016/j.jlumin.2015.03.029

Strona internetowa wydawcy

http://www.elsevier.com

Typ publikacji

Artykuł

Plik został wygenerowany dnia 2026-11-15 06:46:40
Adres w repozytorium https://old.chem.uni.wroc.pl/pl/repozytorium/iFuiTfn.