

Spectroscopy of new Sm(III) orange emitting phosphors of the type $\text{Na}[\text{Sm}(\text{SP})_4]$, $\text{Na}[\text{Sm}(\text{WO})_4]$ (where $\text{SP} = \text{C}_6\text{H}_5\text{S}(\text{O})_2\text{NP}(\text{O})(\text{OCH}_3)^{-}_2$; $\text{WO} = \text{CCl}_3\text{C}(\text{O})\text{NP}(\text{O})(\text{OCH}_3)^{-}_2$) and the polymeric materials obtained on their base.

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Rok wydania

2017

Czasopismo

Optical Materials

Numer woluminu

63

Strony

32-41

DOI

10.1016/j.optmat.2016.08.039

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Among a wide variety of solid state materials lanthanide beta-diketonates, their derivatives and polymeric materials based on them have become essential for advance technologies. Thus they are the subject of extensive spectroscopic studies. Using appropriate lanthanide chelates for the emission layer one can achieve electroluminescence covering the spectrum from blue to infrared. Moreover, compounds with proper chromophores can be the best way to excite and enhance the emission although the f-f transitions have forbidden character. Two types of new Sm(III) chelates; phosphoro and sulfono-derivatives of beta-diketones and polymeric materials on their base were obtained and characterized by the high resolution photoluminescence spectroscopy at 293, 77 and 4 K, as well as by luminescence decay times. Those new type of phosphors shows strong orange emission after excitation at 404 nm Sm(III) states and 280 nm ligand bands. Radiative transition probabilities were calculated from absorption spectra and Judd-Ofelt parameters evaluated. Effects of the temperature, rigidity of polymeric lattice and the energy of excitation on intensities of the Sm(III) fluorescence were studied. The paths of energy transfer are analysed and mechanism of this process is proposed.

Słowa kluczowesm³⁺, Orange emission, Beta-diketonatesAdres publiczny<http://dx.doi.org/10.1016/j.optmat.2016.08.039>Strona internetowa wydawcy<http://www.elsevier.com>

