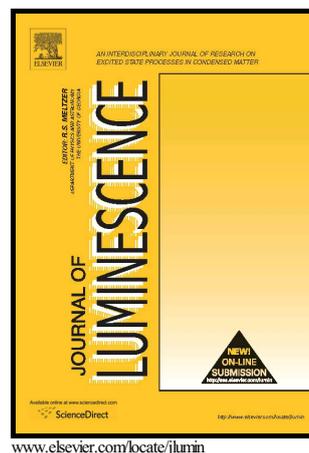


Author's Accepted Manuscript

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PII: S0022-2313(18)30227-8
DOI: <https://doi.org/10.1016/j.jlumin.2018.07.005>
Reference: LUMIN15752

To appear in: *Journal of Luminescence*

Received date: 2 February 2018
Revised date: 24 May 2018
Accepted date: 2 July 2018

Cite this article as: D.A. Metlina, M.T. Metlin, S.A. Ambrozevich, I.V. Taydakov, K.A. Lyssenko, A.G. Vitukhnovsky, A.S. Selyukov, V.S. Krivobok, D.F. Aminev and A.S. Tobokhova, Luminescence and electronic structure of Nd³⁺ complex with pyrazole-substituted 1,3-diketone and 1,10-phenanthroline, *Journal of Luminescence*, <https://doi.org/10.1016/j.jlumin.2018.07.005>

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Luminescence and electronic structure of Nd³⁺ complex with pyrazole-substituted 1,3-diketone and 1,10-phenanthroline

D. A. Metlina^{a,*}, M. T. Metlin^a, S. A. Ambrozevich^{a,b,c}, I. V. Taydakov^{a,b}, K. A. Lyssenko^d, A. G. Vitukhnovsky^{a,b}, A. S. Selyukov^{a,b}, V. S. Krivobok^{a,b}, D. F. Aminev^a, A. S. Tobokhova^{a,b}

^a*P. N. Lebedev Physical Institute of the Russian Academy of Sciences, Leninsky Prospekt 53, 119991 Moscow, Russian Federation*

^b*Moscow Institute of Physics and Technology (State University), Institutsky per. 9, 141700 Dolgoprudny, Moscow Region, Russian Federation*

^c*Bauman Moscow State Technical University, 2-ya Baumanskaya str. 5/1, 105005 Moscow, Russian Federation*

^d*A. N. Nesmeyanov Institute of Organoelement Compounds of the Russian Academy of Sciences, Vavilova St. 28, 119991 Moscow, Russia*

Abstract

We studied luminescent properties of two Nd³⁺ complexes with two different ligands. The first one was 1,3-diketone bearing a pyrazole fragment and the second ligand was either 1,10-phenanthroline or EtOH. For the ligand environment composed of 1,3-diketone and 1,10-phenanthroline the position of the hybrid triplet level was as low as 18200 cm⁻¹. The spectral features specific to Nd³⁺ emission observed in the photoluminescence spectra of the complexes under optical excitation provided the evidence for ion-centered luminescence. Radiative transitions were identified using the obtained spectroscopic data. Corresponding diagram of the energy levels of the complex with 1,10-phenanthroline ligand was developed. Possible energy transfer pathways were discussed.

Keywords: Coordination compounds, neodymium (III), β -diketonates, pyrazole, phenanthroline, luminescence, Judd-Ofelt theory

*Corresponding author

Email address: fekla.andreevna@gmail.com (D. A. Metlina)

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