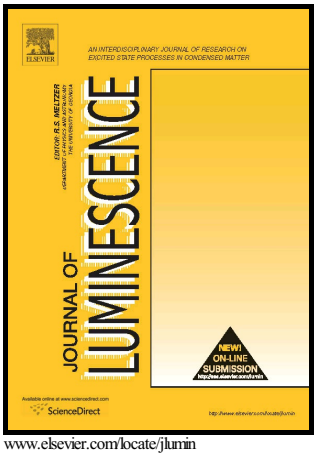

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Luminescence and electronic structure of Nd^{3+} complex with pyrazole-substituted 1,3-diketone and 1,10-phenanthroline

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Abstract

We studied luminescent properties of two Nd^{3+} 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 Nd^{3+} 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

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