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Near-infrared Emission in $Na_5Y(WO_4)_4 : Nd^{3+}$

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Luminescence in $Na_5Y(WO_4)_4 : Nd^{3+}$ is investigated for the first time. The emission is in the near-infrared region. The well-known $^4F_{3/2} \rightarrow {}^4I_{9/2}$ transition leads to most intense line at 1069 nm. The excitation and emission spectra are interpreted using the energy level diagram of Nd^{3+}. The excitation spectrum is made up of a large number of sharp lines attributable to various $f-f$ transitions. A weak band at 360 nm in the excitation spectrum is assigned to the host. Notwithstanding large Y−Y distances, the luminescence is quenched at concentrations exceeding 2 mol.%. The critical distance for energy transfer among Nd^{3+} ions is found to be 32.85 Å.

Keywords: luminescence, phosphor, tungstate, Nd^{3+}.