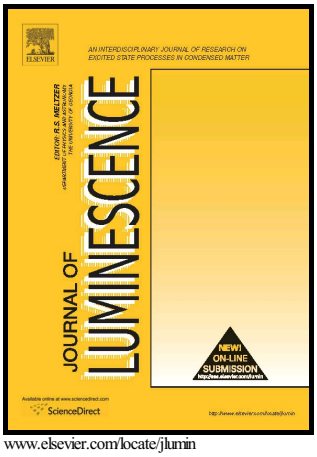

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Effect of Tb^{3+} Concentration on Luminous Properties of $Y_{0.92-x}PO_4$:0.08Ce, *x*Tb Microparticles

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Abstract

Uniform $Y_{0.92-x}PO_4$:0.08Ce, *x*Tb microparticles were fabricated by hydrothermal method, and their structural and luminous properties were characterized. SEM and TEM images confirmed the existence of clavate and prismatic microparticles, with a good lattice structure. XRD analysis showed a pure tetragonal phase of the samples. The growth mechanism and the function of sodium citrate ($Na_3C_6H_5O_7 \cdot 2H_2O$, Na_3Cit) on the morphology and size of $Y_{0.92-x}PO_4$:0.08Ce, *x*Tb microparticles were discussed. The photoluminescence (PL) spectra indicated that the Ce^{3+}/Tb^{3+} co-doped YPO_4 exhibits a strong green illumination under the long-wave ultraviolet (UV) excitation. What's More, the PL spectra, decay time and quantum efficiency with different doped concentration of Tb^{3+} were discussed.

Key words: Ce^{3+}/Tb^{3+} co-doped YPO_4; hydrothermal synthesis; phosphor; photoluminescence; quantum yield