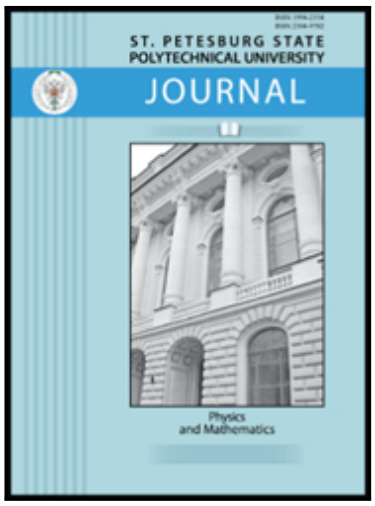

Greenish blue luminescence in $NaCd_{(1-x)}$ SO_4F: xEu^{2+} halosulphate phosphor for solid state lightening devices

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Greenish blue luminescence in $NaCd_{(1-x)}SO_4F: xEu^{2+}$ halosulphate phosphor for solid state lightening devices

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Abstract:

A Series of new greenish blue emitting halosulphate phosphors $NaCd_{(1-x)}SO_4F: xEu^{2+}$ (x=1,3,5,7 mol%) was synthesized by re-crystallization method and its phase formation was confirmed by using the x-ray powder diffraction (XRD) technique. Fourier transform infrared spectroscopy (FTIR) characterizations and SEM analysis have also been investigated to explore the existence of various stretching bands and study of particle morphology. The photoluminescence (PL) results showed that the phosphor was excited by ultraviolet (UV) light at the wavelength of 200nm-400nm, and it exhibited bright greenish blue emission under 280nm UV light. The emission spectrum showed that a single broad band centered at 500nm, corresponding to the $_4f^6{}_5d^1 \rightarrow {}_4f^7$ transition of Eu^{2+}. The Eu^{2+} concentration dependent PL in $NaCdSO_4F:Eu^{2+}$ indicated that there was dipole-dipole interaction of Eu^{2+} ions. The critical transfer distance was around $15.51A^0$.The $NaCdSO_4F:Eu^{2+}$ halosulphate phosphor under 280nm excitation is very suitable for UV applications in solid state lightening devices.

Key Words : Luminescence; Halosulphate phosphor; FTIR**;** Re-crystallization.