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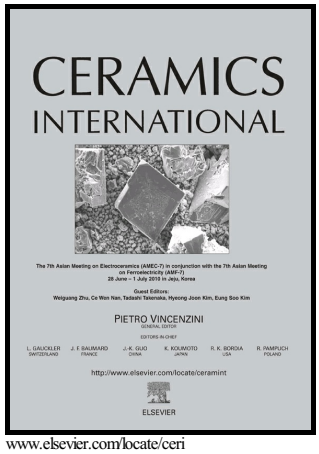

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Thermometry of red nanoflaked $SrAl_{12}O_{19}:Mn^{4+}$ synthesized with boric acid flux

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ABSTRACT

This paper presents the luminescence properties and potential of red $SrAl_{12}O_{19}:Mn^{4+}$ (SAO:Mn^{4+}) phosphor for optical thermometry application. The SAO crystal consisted of a spinel block along with two mirror-like blocks. The Al^{3+}/Sr^{2+} molar ratio of the precursor solution affected the crystalline-phases, morphology, and photoluminescence of the phosphor. The addition of flux H_3BO_3 promoted the growth of hexagonal-nanoflakes and enhanced the external quantum efficiency of phosphor 2.6-fold. The absolute sensitivity S_a and relative sensitivity S_r of SAO:Mn^{4+} showed a linear function of the temperature. The value of S_a was 4.17×10^{-3} K^{-1}, and the maximum S_r was 2.70×10^{-3} K^{-1} at 393 K. A stable emission color was observed even