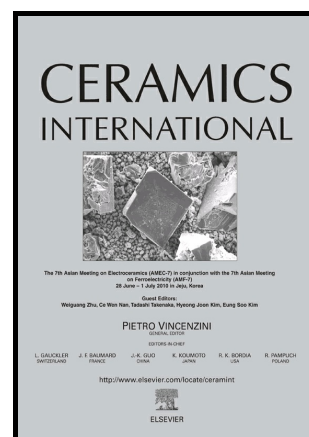


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# LiCa<sub>3</sub>MgV<sub>3</sub>O<sub>12</sub>:Sm<sup>3+</sup>: A new high-efficiency white-emitting phosphor

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## Abstract

A novel single-phased white-light-emitting phosphor Sm<sup>3+</sup> doped LiCa<sub>3</sub>MgV<sub>3</sub>O<sub>12</sub> (LCMV) was developed. The LCMV host was one self-activated bluish-green emitting phosphor, which possessed an efficient excitation band in the 250–400 nm wavelength range and showed an intense broadband bluish-green emission with internal quantum efficiency (IQE) of 39%. Doping Sm<sup>3+</sup> ions in to LCMV host induced tunable-color emissions, due to the energy transfer from [VO<sub>4</sub>]<sup>3-</sup> to Sm<sup>3+</sup> ions. Importantly, under 340 nm excitation, the LCMV:Sm<sup>3+</sup> can emitted bright white light by combining the self-activated luminescence of LCMV host and the red emissions of Sm<sup>3+</sup> ions, and the IQE of the white-emitting composition-optimized LCMV:0.01Sm<sup>3+</sup> phosphors reached up to 45%. These white-emitting LCMV:Sm<sup>3+</sup> phosphors have potential applications in white light-emitting diodes and optical display devices.

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