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Title: A near-ultraviolet (NUV) converting blue-violet $Mg_{2-x}Al_{3.96}Si_{5.04}O_{18}$:xCe³⁺ phosphor for white light-emitting-diodes (w-LEDs)

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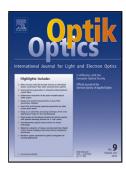
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near-ultraviolet (NUV) converting blue-violet

 $Mg_{2-x}Al_{3.96}Si_{5.04}O_{18}:xCe^{3+}$ phosphor for white

light-emitting-diodes (w-LEDs)

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Abstract: A phosphor $Mg_{2-x}Al_{3.96}Si_{5.04}O_{18}:xCe^{3+}$, x = 0.02-0.14 for white NUV w-LEDs has been

prepared using solid-state reaction method. The as-obtained phosphors have been investigated by

fluorescence spectrophotometer and XRD, respectively. The XRD data demonstrate the aim phase has

been synthesized and the diffraction peaks have shifted with the increasing of Ce³⁺ concentration. The

Mg_{2-x}Al_{3.96}Si_{5.04}O₁₈:xCe³⁺ phosphor shows a strong blue-violet emission under the excitation of NUV

radiation. The fitting results of the emission spectra show the emission spectrum contains two single

bands, which come from the transition of ${}^2D_{2/3} \rightarrow {}^2F_{7/2}$ and ${}^2F_{5/2}$ of the Ce³⁺ ion. The colorimetric

coordinate of sample with x = 0.06 is (0.1499, 0.0704), locating in blue-violet region. We have obtained

bright blue-violet light via pumping the sample by NUV light ($\lambda \approx 302$ nm), suggesting that this material

be potential as a NUV converting blue-violet phosphor for the NUV w-LEDs.

Keywords: NUV w-LEDs, solid-state reaction, crystal structure, Mg₂Al_{3,96}Si_{5,04}O₁₈, phosphors

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