

**Thermally Stable Narrow-Band Green-Emitting Phosphor $\text{MgAl}_2\text{O}_4\text{:Mn}^{2+}$
toward Wide Color Gamut Backlight Display Application**

E. H. Song, Y. Y. Zhou, Y. Wei, X. X. Han, Z. R. Tao, R. L. Qiu, Z. G. Xia
and Q. Y. Zhang**

*State Key Laboratory of Luminescent Materials and Devices, Guangdong Provincial
Key Laboratory of Fiber Materials and Applied Techniques, South China University
of Technology, Guangzhou 510641, China*

*Corresponding Email: msehsong@scut.edu.cn; qyzhang@scut.edu.cn;

The Supporting information contains 7 pages, including 5 Figures (Figure S1-S3) and
1 Table (Table S1).

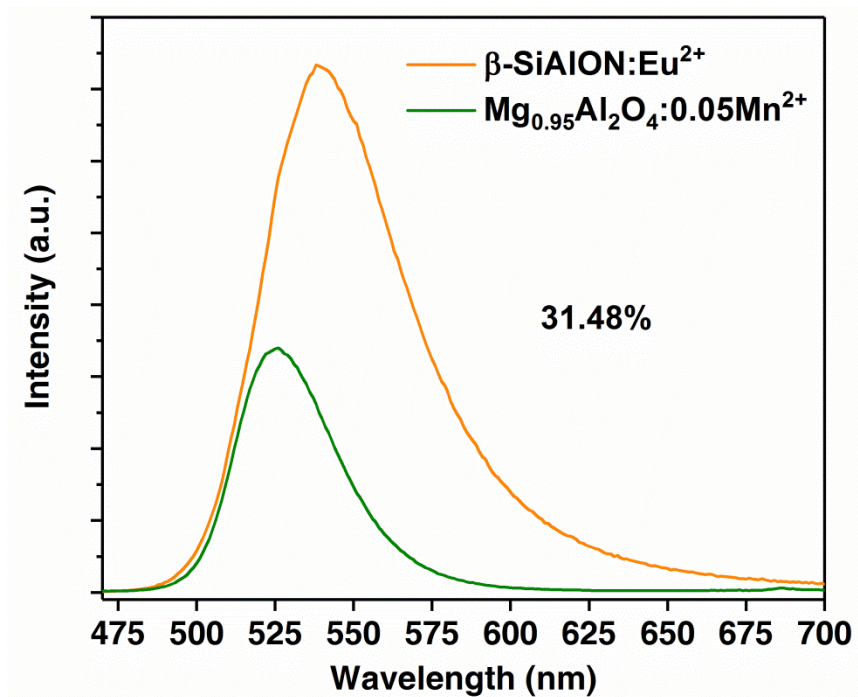


Fig. S1. The emission spectra of $\text{MgAl}_2\text{O}_4:\text{Mn}^{2+}$ and commercial $\beta\text{-SiAlON:Eu}^{2+}$ upon 450 nm excitation under the same measure conditions.

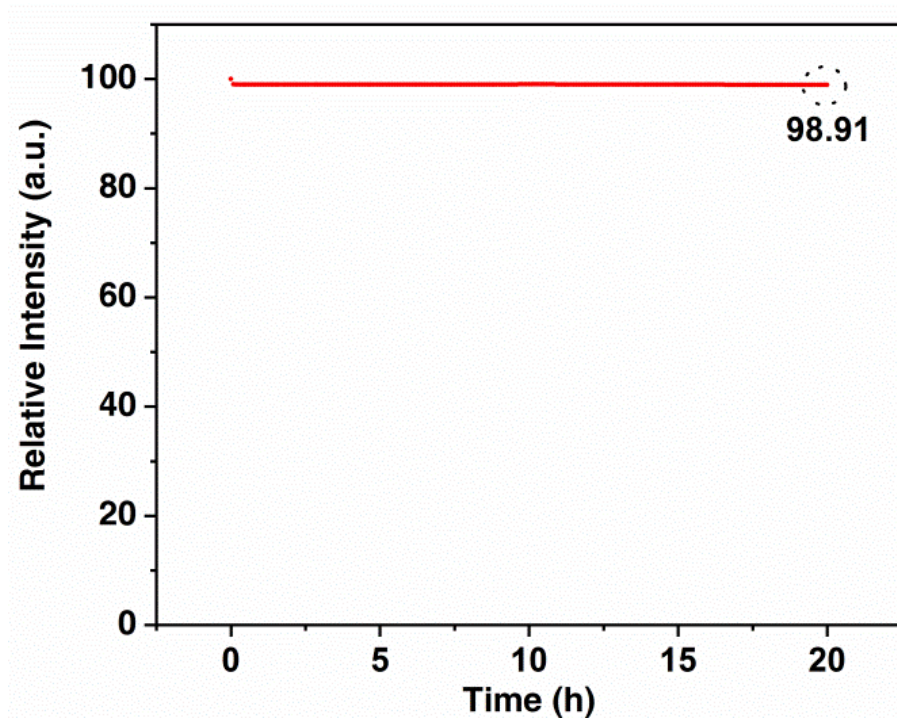


Fig. S2. Blue-light irradiation time dependence of emission intensity in $\text{MgAl}_2\text{O}_4:\text{Mn}^{2+}$.

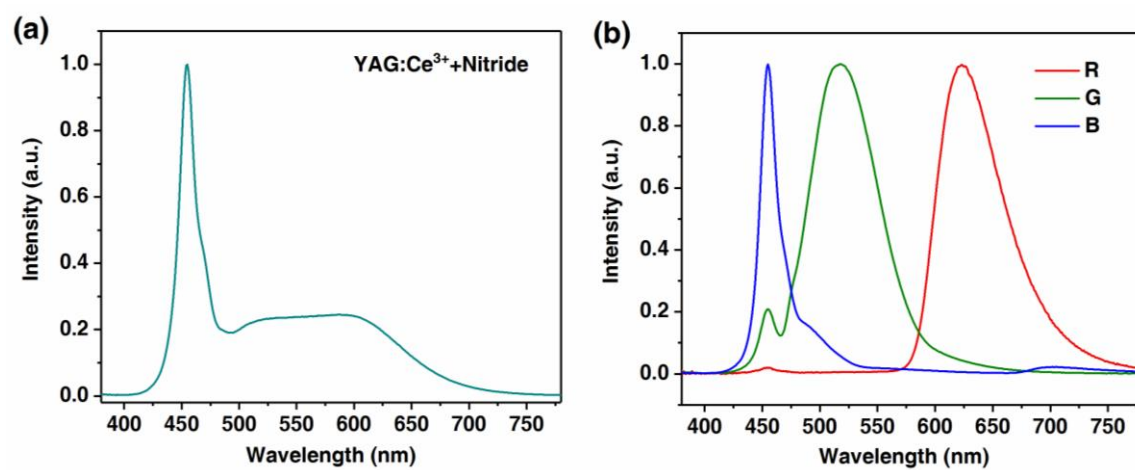


Fig. S3. The emission spectra spectra of LED II under a driven current of 20 mA and the corresponding RGB spectra after using conventional commercial color filters filtering.

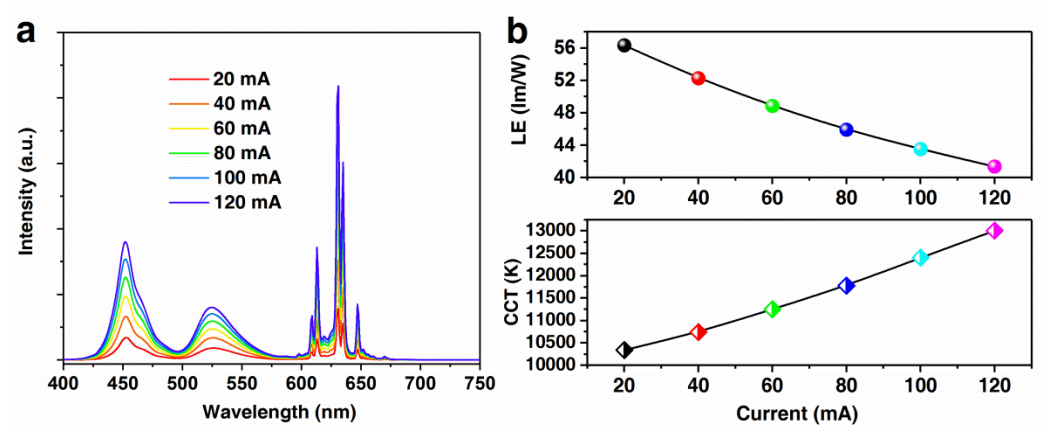


Fig. S4. Current-dependent (a) EL spectra, (b) luminous efficacy and CCT of LED I.

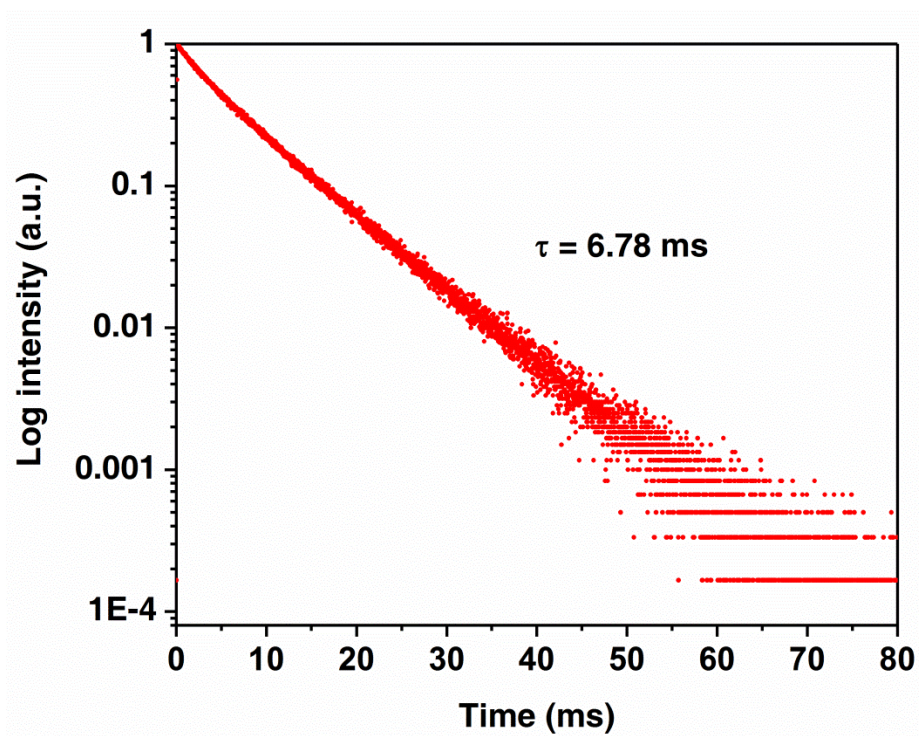


Fig. S5. Luminescence decay curve of KSF:Mn⁴⁺(monitored at 630 nm).

Table S1. Mn K-edge EXAFS curve fitting parameters in $\text{Mg}_{0.95}\text{Al}_2\text{O}_4:0.05\text{Mn}^{2+}$.

Chemical Bond	CN (Coordination Number)	R(Å) (Distance)	$\sigma^2(\text{\AA}^2)$ (Debye Waller Factor)	ΔE_0 (eV) (Edge-energy shift)
Mn-O	4	2.0131	0.0054	-7.2

Error bounds of the structural parameters were estimated as $R \pm 10\%$; $\sigma^2 \pm 20\%$; $\Delta E_0 \pm 20\%$. Mn K-edge fitting range: K-space range: 3-11; R-space range: 1-2.3 Å. The S_0^2 is fixed at 0.97.