

Electronic Supplementary Information to:

**Ultrastable Red-emitting Phosphor-in-glass for Superior High-power
Artificial Plant Growth LEDs**

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Table S1. CIE coordinates of 6 wt% MMG:Mn⁴⁺-PiG and MMG:Mn⁴⁺ phosphor at different temperatures.

T (°C)	CIE (X, Y)	
	PiG	Phosphor
30	(0.710, 0.290)	(0.710, 0.290)
60	(0.709, 0.291)	(0.709, 0.291)
90	(0.709, 0.291)	(0.708, 0.292)
120	(0.708, 0.292)	(0.707, 0.293)
150	(0.707, 0.293)	(0.706, 0.294)
180	(0.706, 0.294)	(0.706, 0.294)
210	(0.706, 0.294)	(0.705, 0.295)

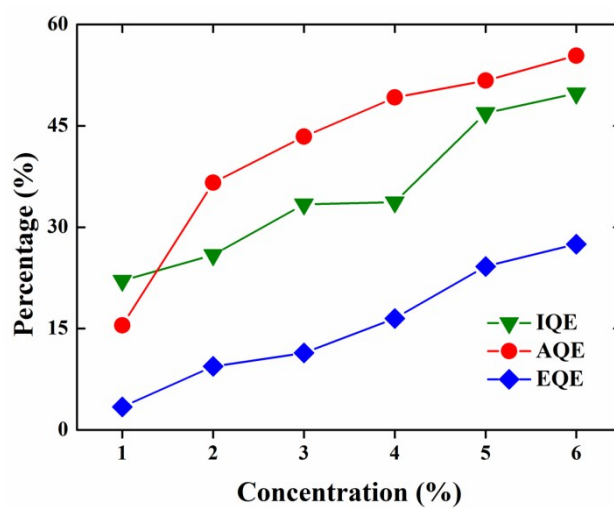


Figure S1. Dependence of IQE, AQE and EQE on phosphor doping concentration in MMG:Mn⁴⁺-PiG.

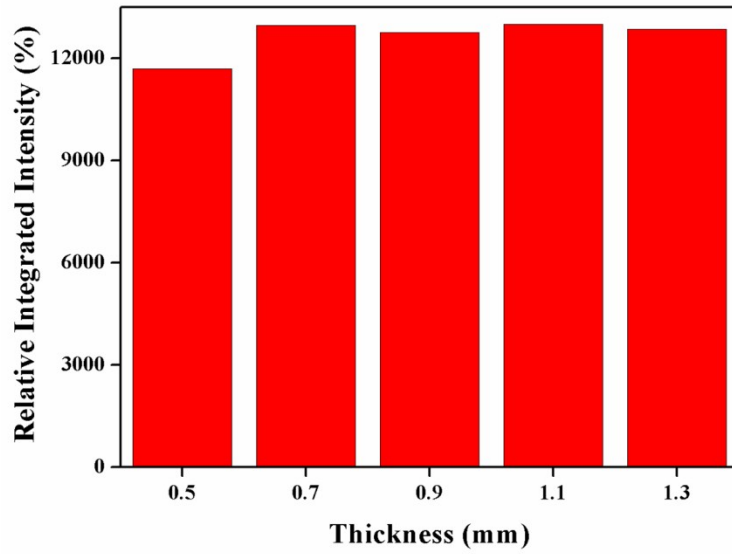


Figure S2. The relative integrated PL intensity of 6 wt% MMG:Mn⁴⁺-PiG versus various thicknesses from 0.5 to 1.3 mm.

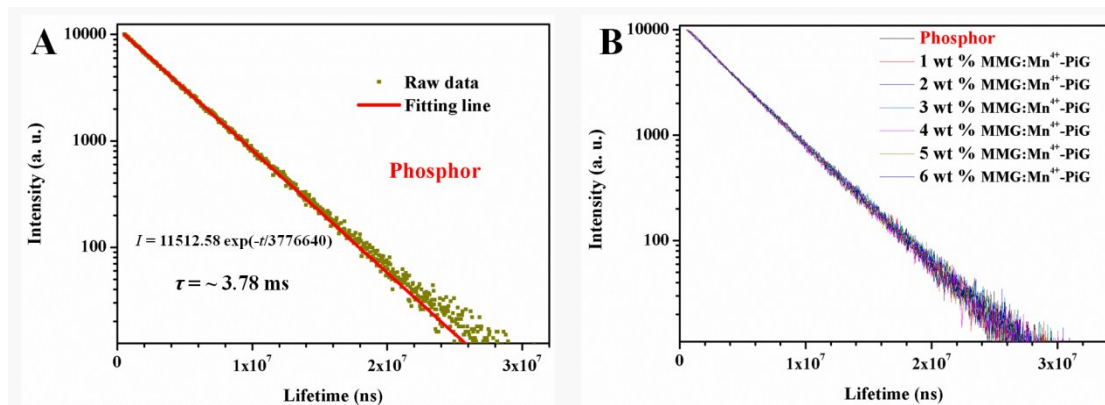


Figure S3. The decay curves of (A) MMG:Mn⁴⁺ phosphor and (B) MMG:Mn⁴⁺-PiG with different phosphor doping concentrations.

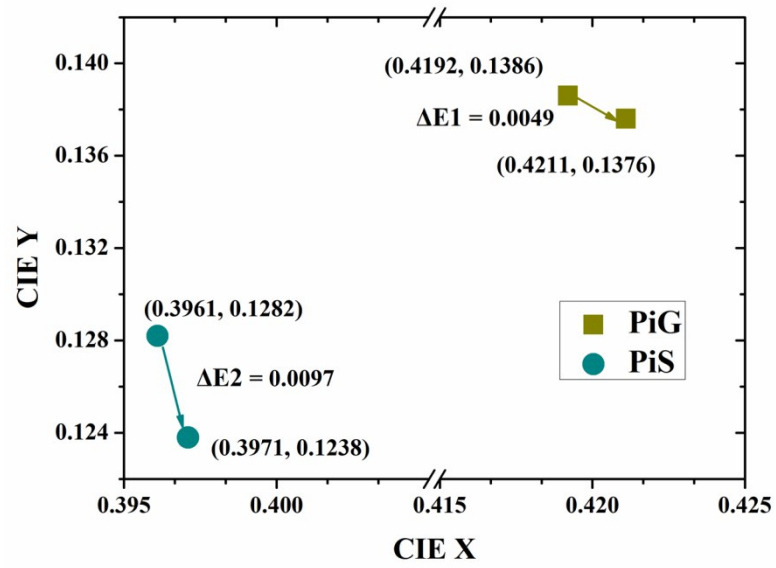


Figure S4. The variation of CIE color coordinates of 6 wt% MMG:Mn⁴⁺-PiG (thickness = 1.1 mm) and PiS based LED-PGLs before and after 12-hour continuous operation test at an current of 300 mA.