

A novel Mn⁴⁺ doped red phosphor composed of MgAl₂O₄ and CaAl₁₂O₁₉ phases for Light-Emitting Diodes

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Table S1 Results of EDX measurements (in atom%) for CMA:Mn⁴⁺

| Element | Theoretical(atom%) | Experimental(atom%) |
|---------|--------------------|---------------------|
| Ca | 2.17 | 1.39 |
| Mg | 4.35 | 2.35 |
| Al | 34.78 | 24.92 |
| O | 58.70 | 71.27 |

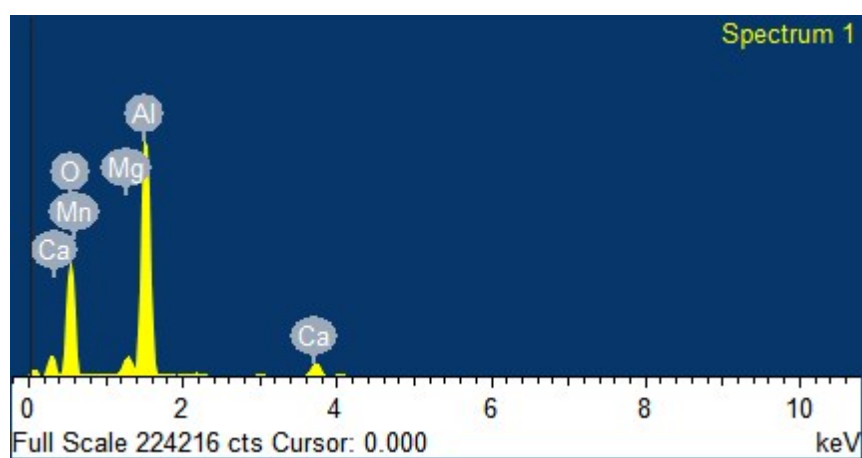


Fig. S1. Exemplary EDX-Spectra of CMA:Mn⁴⁺

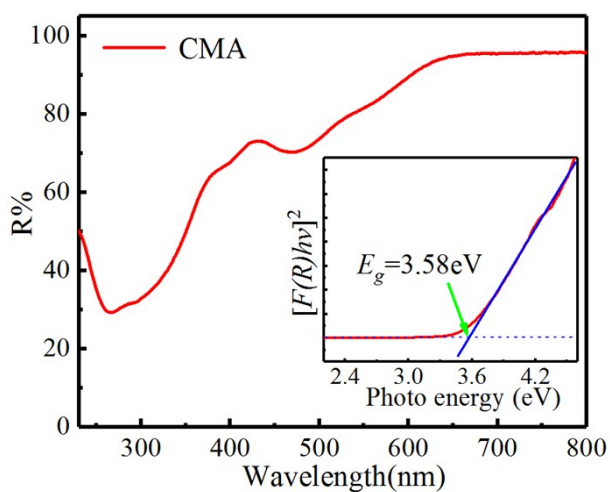


Fig. S2 The diffuse reflectance spectra of CMA:Mn⁴⁺ at room temperature.

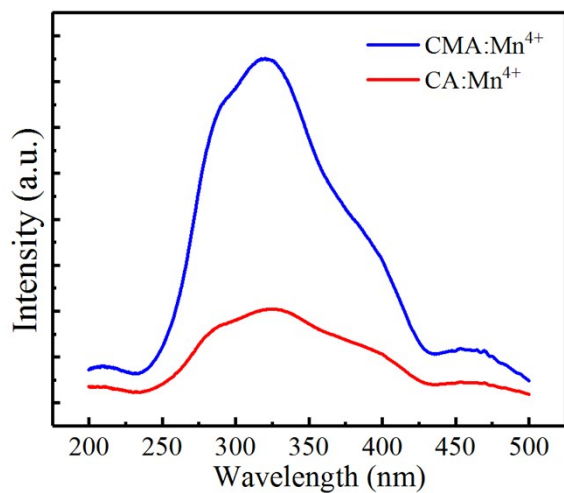


Fig. S3 The excitation spectra of CA:Mn⁴⁺ and CMA:Mn⁴⁺ monitored at 658 nm, respectively.

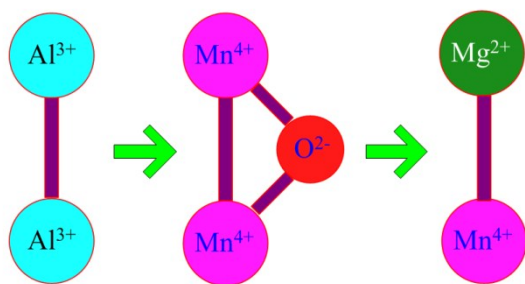


Fig. S4 Schematic illustration of Mn⁴⁺-Mn⁴⁺ pairs in connection with interstitial O²⁻ transformed into isolated Mn⁴⁺ ions with Mg²⁺ ions.

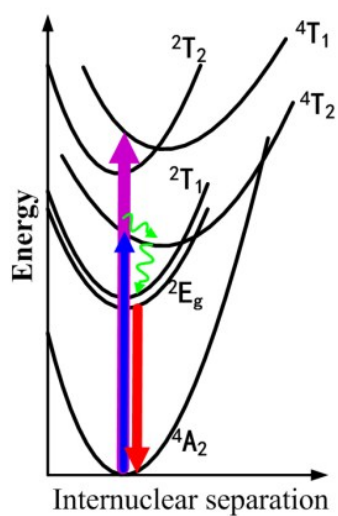


Fig. S5 Configurational coordinate diagram for Mn⁴⁺ ions.