Supporting Information

The incorporation of Ge^{4+} enhances the performance of $La_2MgSnO_6:Mn^{4+}$ Double Perovskite Phosphors

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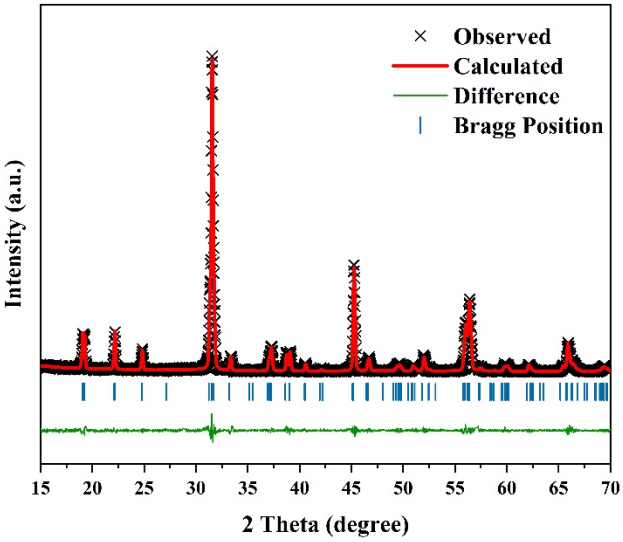

Figure S1. Rietveld refinement spectrum of LMSO:0.002Mn^{4+}

Table S1. Main crystallographic parameters of LMSO:0.002Mn^{4+}.

Compound	LMSO:0.002Mn^{4+}
Space group	$P2_1/n$
a (Å)	5.6387
b (Å)	5.7250
c (Å)	8.0219
α (°)	90°
β (°)	90.085
γ (°)	90
Crystal system	Monoclinic
Z	2
R_{wp} (%)	9.76
R_p (%)	7.32
χ^2	2.02

Table S2. Splitting and energies of Mn^{4+} Ls Terms.

Spectroscopic term	Energy (cm^{-1})	Energy (expressed in Racah parameters)	Split energy levels
^4F	0	0	$^4A_{2g}+^4T_{1g}+^4T_{2g}$
^4P	17400	15B	$^4T_{1g}$
^2G	17549	4B+3C	$^2T_{2g}+^2T_{1g}+^2E_g$
^2P	23349	9B+3C	$^2T_{1g}$
^2H	23349	9B+3C	$^2E_g+^2T_{1g}+^2T_{1g}+^2T_{2g}$
^2D	25644	$20B+5C+(19B^2+8BC+4C^2)^{1/2}$	$^2T_{2g}+^2E_g$
^2F	40749	24b+3C	$^2A_{2g}+^2T_{1g}+^2T_{2g}$