

Fig.S1 XRD patterns of $\text{LiZnGe}_3\text{O}_8$ heated at different temperature.

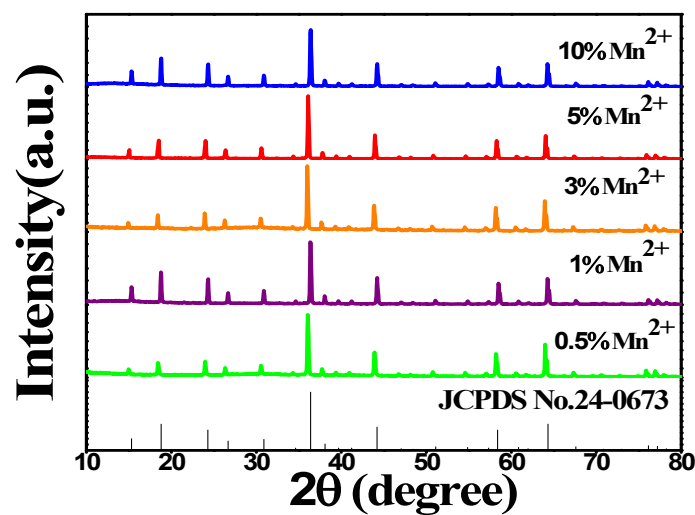


Fig.S2 XRD patterns of $\text{LiZnGe}_3\text{O}_8$: $x\text{Mn}^{2+}$ ($x=0.005, 0.01, 0.03, 0.05, 0.10$) heated at 950 for 3h.

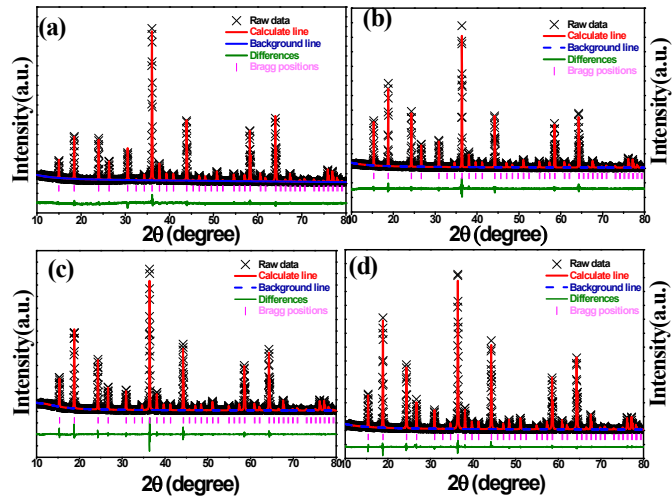


Fig.S3 (a), (b), (c), (d) Rietveld refinement of $\text{Li}_2\text{ZnGe}_3\text{O}_8: 3\%\text{Mn}^{2+}$, $\text{Li}_2\text{Zn}_{0.7}\text{Mg}_{0.3}\text{Ge}_3\text{O}_8: 3\%\text{Mn}^{2+}$, $\text{Li}_2\text{Zn}_{0.5}\text{Mg}_{0.5}\text{Ge}_3\text{O}_8: 3\%\text{Mn}^{2+}$ and $\text{Li}_2\text{Zn}_{0.3}\text{Mg}_{0.7}\text{Ge}_3\text{O}_8: 3\%\text{Mn}^{2+}$

Table S1 Crystallographic data and details in the data collection and refinement parameters for the $\text{Li}_2\text{ZnGe}_3\text{O}_8$, $\text{Li}_2\text{ZnGe}_3\text{O}_8:3\%\text{Mn}^{2+}$ samples.

Sample	$\text{Li}_2\text{ZnGe}_3\text{O}_8$	$\text{Li}_2\text{ZnGe}_3\text{O}_8:3\%\text{Mn}^{2+}$
Space group	P 43 3 2	P 43 3 2
Symmetry	cubic	cubic
2 θ -interval(°)	10-80	10-80
a, Å	8.183020	8.199222
b, Å	8.183020	8.199222
c, Å	8.183020	8.199222
V, Å ³	547.950	551.211
R _p	6.99%	5.55%
R _{wp}	9.05%	7.59%
χ^2	4.035	4.156
α (°)	90.00	90.00
β (°)	90.00	90.00
γ (°)	90.00	90.00
Z	4	4

Table S2 Crystallographic data and details in the data collection and refinement parameters for part of the samples.

Samples	a/b/c (Å)	V(Å ³)
$\text{Li}_2\text{ZnGe}_3\text{O}_8:3\%\text{Mn}^{2+}$	8.199222	551.211
$\text{Li}_2\text{Zn}_{0.7}\text{Mg}_{0.3}\text{Ge}_3\text{O}_8:3\%\text{Mn}^{2+}$	8.193654	550.089
$\text{Li}_2\text{Zn}_{0.5}\text{Mg}_{0.5}\text{Ge}_3\text{O}_8:3\%\text{Mn}^{2+}$	8.193233	550.004
$\text{Li}_2\text{Zn}_{0.3}\text{Mg}_{0.7}\text{Ge}_3\text{O}_8:3\%\text{Mn}^{2+}$	8.18587	548.510