Electronic Supplementary Material (ESI) for Dalton Transactions.
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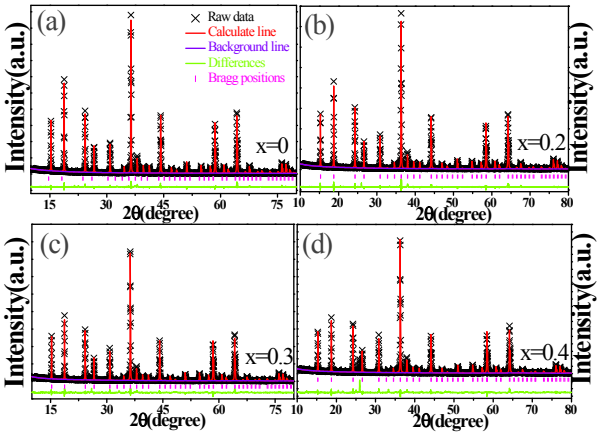

Fig.S1 X-ray Rietveld refinement patterns of $Li_{2(1-x)}Zn_{(1+x)}Ge_3O_8$:3%$Mn^{2+}$($x$=0-0.4). Observed (black crosses), calculated (red line), and difference profiles are displayed along with expected reflection positions.

Table S1 Crystallographic parameters from X-ray Rietveld refinements of $Li_{2(1-x)}Zn_{1+x}Ge_3O_8$:3%$Mn^{2+}$ (x = 0, 0.2, 0.3 and 0.4)

	x=0	x=0.2	x=0.3	x=0.4
Cell parameters				
a/b/c(Å)	8.172	8.199	8.202	8.205
α/β/γ(°)	90	90	90	90
Volume($Å^3$)	545.78	551.12	551.67	552.36
Reliability factors				
R_p(%)	5.5	6.71	7.5	9.59
R_{wp}(%)	7.62	9.55	11.08	12.42
χ^2	2.80	3.302	4.361	5.45

Table S2 Atomic occupancy of $Li_{2(1-x)}Zn_{1+x}Ge_3O_8$:3%$Mn^{2+}$ ($0 \le x < 0.5$)

Atom	x=0 (occupancy)	x=0.2 (occupancy)	x=0.3 (occupancy)	x=0.4 (occupancy)
Li1	0.6231	0.4690	0.4198	0.3667
Zn1	0.3669	0.5160	0.5632	0.6133
Li2	0.6727	0.8185	0.8493	0.9031
Zn2	0.3073	0.1665	0.1377	0.0869
Ge	1.00	1.00	1.00	1.00

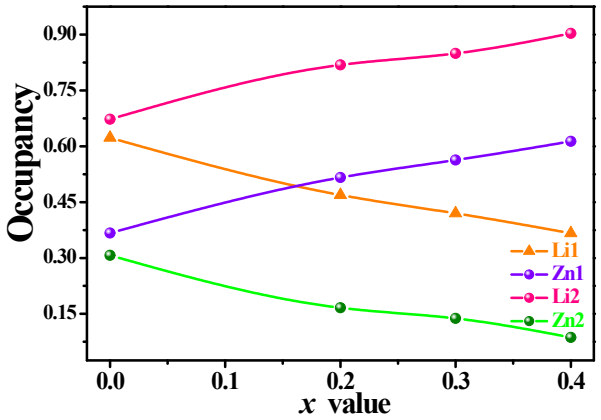

Fig.S2 Structural refinement results for $Li_{2(1-x)}Zn_{1+x}Ge_3O_8$:3%$Mn^{2+}$ ($0 \leq x < 0.5$) with the relative changes in the lattice parameters.

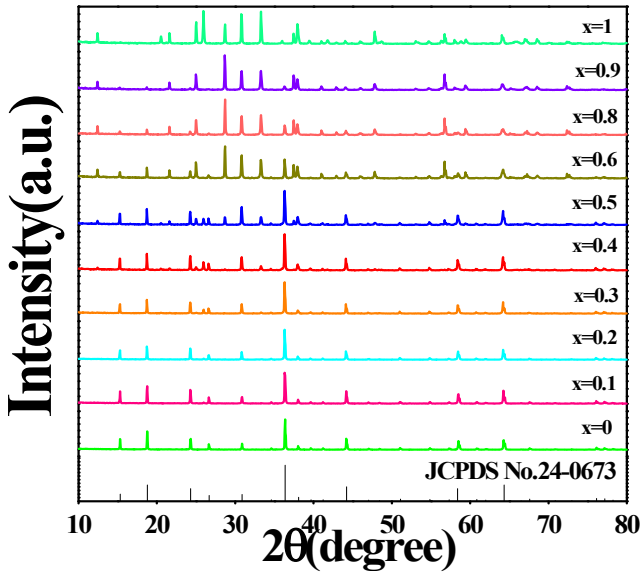

Fig.S3 XRD patterns of $Li_{2(1-x)}Zn_{(1+x)}Ge_3O_8$:3%$Mn^{2+}$ ($0 \leq x \leq 1$) heated at 950℃.

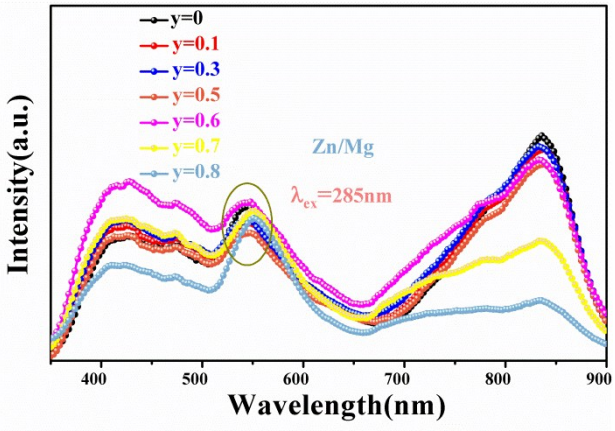

Fig.S4 The PL spectra of $Li_2Zn_{1-y}Mg_yGe_3O_8$: Mn^{2+} under 285nm excited with different Zn/Mg ratios.

Table S3 Crystallographic parameters and atomic occupancy of $Li_2Zn_{1-m}Ba_mGe_3O_8$:3%Mn^{2+}(m=0,0.3)

Cell parameters	host	*m*=0	*m*=0.3
a/b/c(Å)	8.164	8.172	8.206
α/β/γ(°)	90	90	90
Volume($Å^3$)	544.23	545.78	552.48
Atom	occupancy	occupancy	occupancy
Li1	0.667	0.667	0.667
Zn1	0.333	0.325	0.183
Li2	0.667	0.667	0.667
Zn2	0.333	0.308	0.245
Ge	1	1	0.986