Supporting Information

The broadband emission of Cr^{3+} doped $CaY_2Mg_2Ge_3O_{12}$ and its applications for NIR detector

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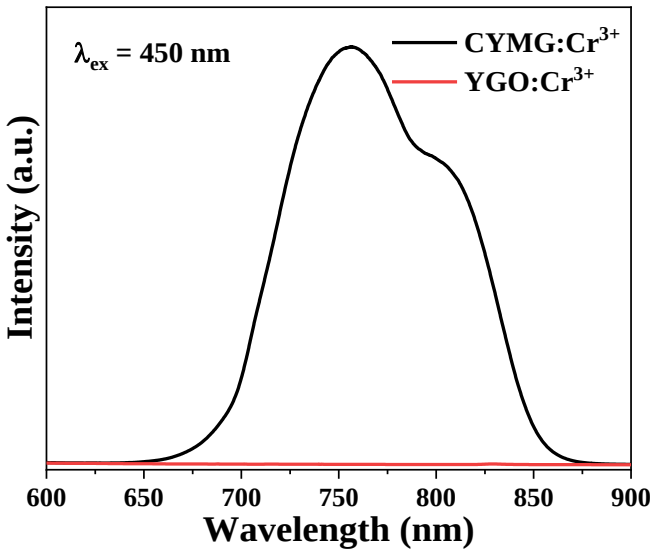


Figure S1. Emission spectra of Cr^{3+} in CYMG and YGO.

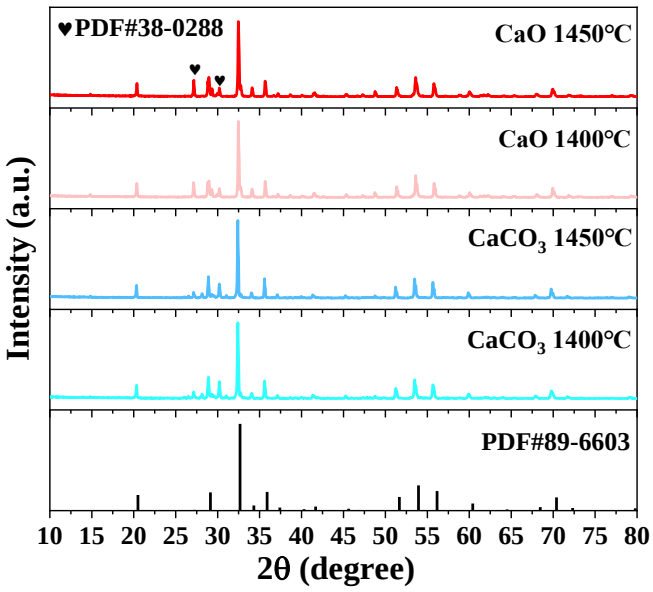
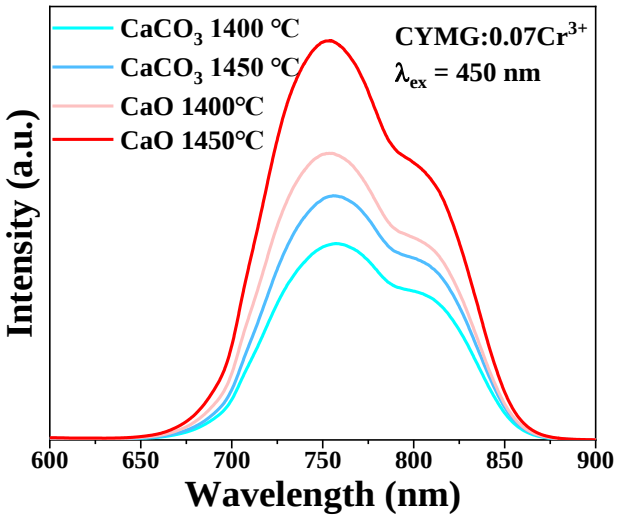


Figure S2. XRD patterns of different Ca sources.



FigureS3. Luminescence spectra of $CaCO_3$ and CaO as Ca sources at two different temperatures.

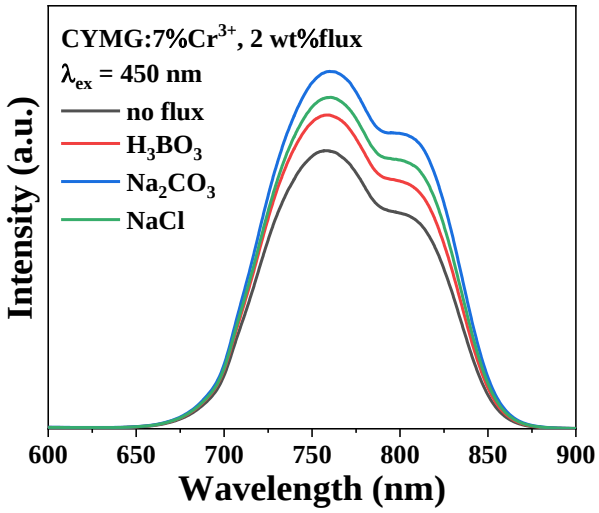


Figure S4. Emission spectra of CYMG: 7% Cr^{3+} with different fluxes.

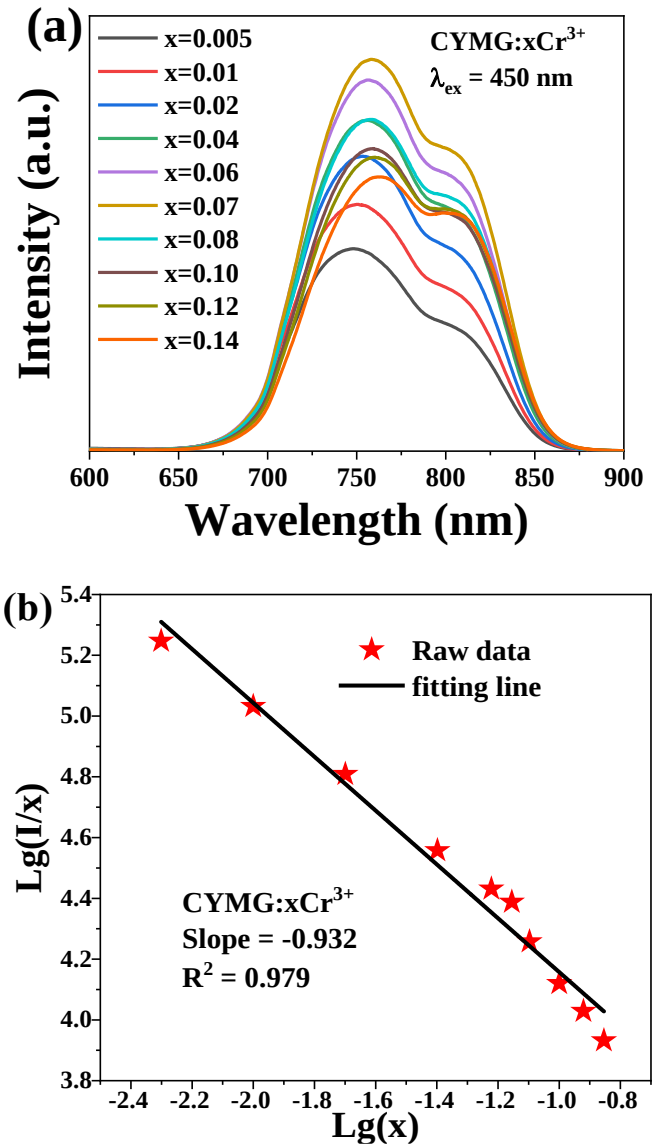


Figure S5. (a) PL of CYMG:xCr^{3+} excited at 450 nm; (b) Relationship between log(I/x) and log(x) of CYMG:xCr^{3+}

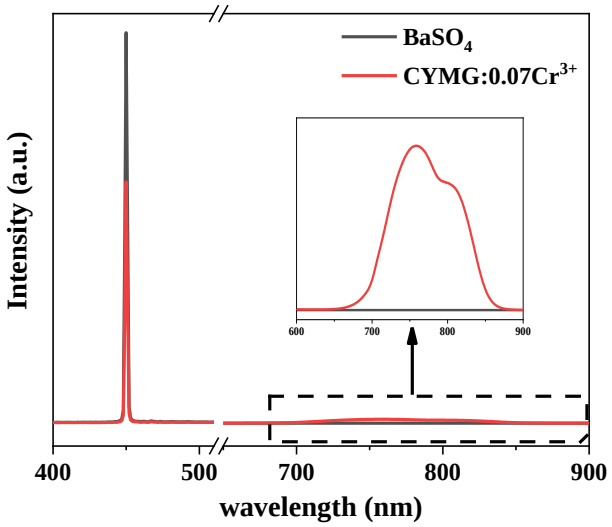


Figure S6. The internal quantum efficiency of CYMG:xCr^{3+}

Table S1. Emission peak, FWHM, temperature stability and IQE of Cr^{3+} phosphors doped with different hosts

phosphor	λ_{em} (nm)	FWHM	$I_{150°C}$ (%)	IQE (%)	Ref.
$Na_3ScF_6:Cr^{3+}$	774	108	30	91.5	S1
$ScBO_3:Cr^{3+}$	800	120	50	65	S2
$Ca_2LuZr_2Al_3O_{12}:Cr^{3+}$	754	117	60	69	S3
$BaMgAl_{10}O_{17}:Cr^{3+}$	696	92.6	63	94	S4
$LiScSi_2O_6:Cr^{3+}$	845	156	75	64.4	S5
$LiInSi_2O_6:Cr^{3+}$	840	143	77	75	S6
$CaLu_2Mg_2Si_3O_{12}:Cr^{3+}$	750	/		85.7	S7
$CaY_2Mg_2Ge_3O_{12}:Cr^{3+}$	758	115	81	81.1	This work

Table S2. Photoelectric characteristics of NIR pc-LED devices under the different driving current

Current (mA)	Input power (mW)	Output power (mW) (74.525%) Measurement data	Output power (mW) (100%) Complete data	Conversion efficiency
20	51	4	5.367	10.524
50	133	10	13.418	10.089
100	276	19	25.495	9.237
150	426	25	33.546	7.875
200	580	31	41.597	7.172
250	740	34	45.223	6.111
300	907	35	46.964	5.178
350	1078	36	48.306	4.481
400	1256	37	49.648	3.953

Reference

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