Supporting information

Structure, spectroscopic properties and optical temperature sensing behavior of glass-ceramics containing polymorphic $CaTa_2O_6$: Er^{3+}/Yb^{3+} nanocrystals

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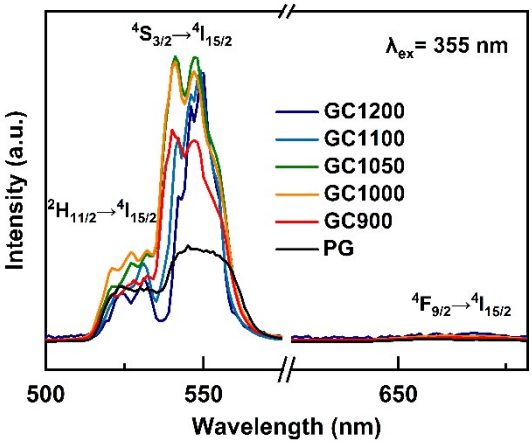

Fig. S1 Photoluminescence spectra of PG and GCs under 355 nm excitation.

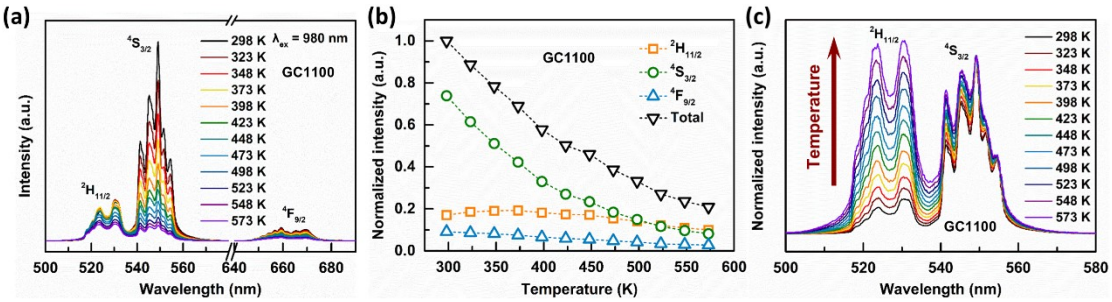

Fig. S2 (a) Temperature-dependent spectra, (b) the corresponding integrated intensity and (c) normalized UC emission spectra of GC1100 under 980 nm excitation.

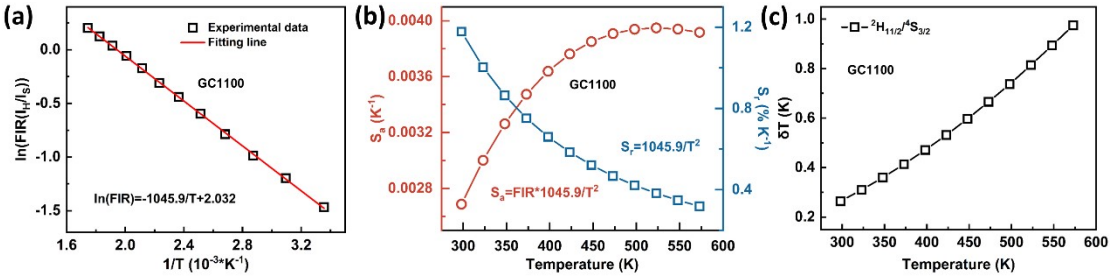

Fig. S3 (a) Experimental and the linear fitted ln(FIR) versus 1/*T* of the two TCLs ($^2H_{11/2}/^4S_{3/2}$) for GC1100. (b) Relative sensitivity and absolute sensitivity variation with temperature for GC1100. (c) Temperature resolution of TCLs ($^2H_{11/2}/^4S_{3/2}$) for GC1100.

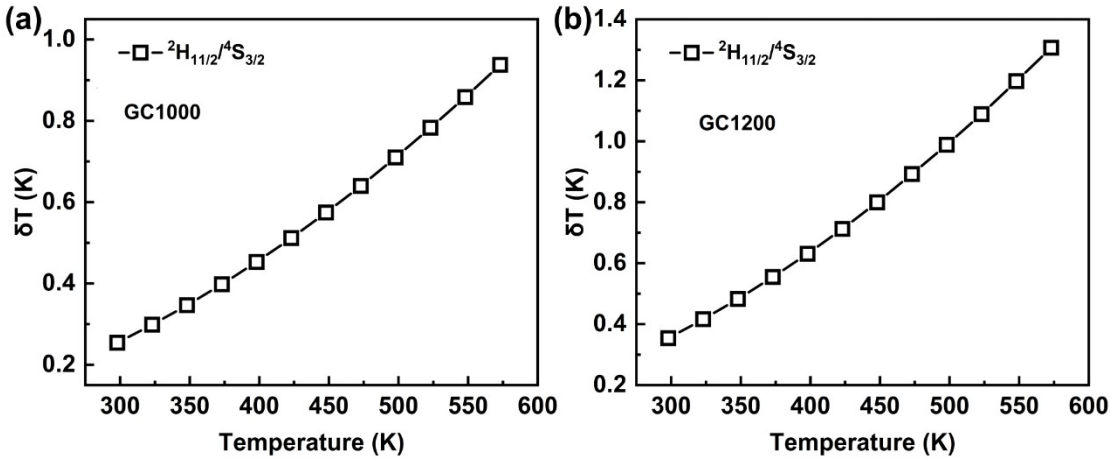

Fig. S4 Temperature resolution of TCLs ($^2H_{11/2}/^4S_{3/2}$) of (a) GC1000 and (b) GC1200.

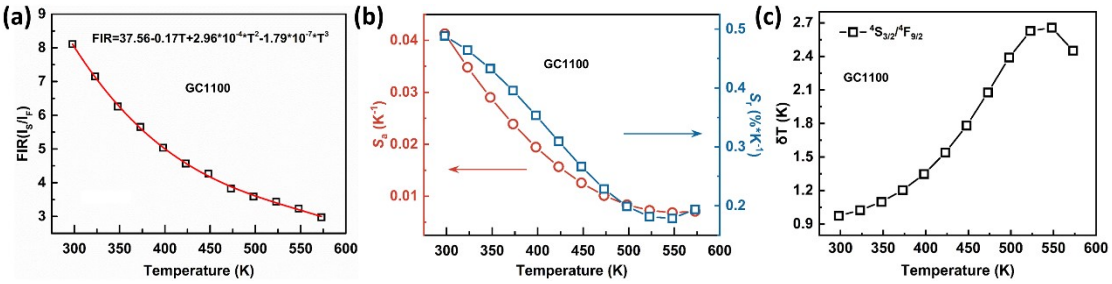

Fig. S5 (a) Experimental and the fitted FIR of the two NTCLs ($^4S_{3/2}/^4F_{9/2}$) for GC1100 (b) Relative sensitivity and absolute sensitivity variation with temperature for GC1100. (c) Temperature resolution of NTCLs ($^4S_{3/2}/^4F_{9/2}$) of GC1100.

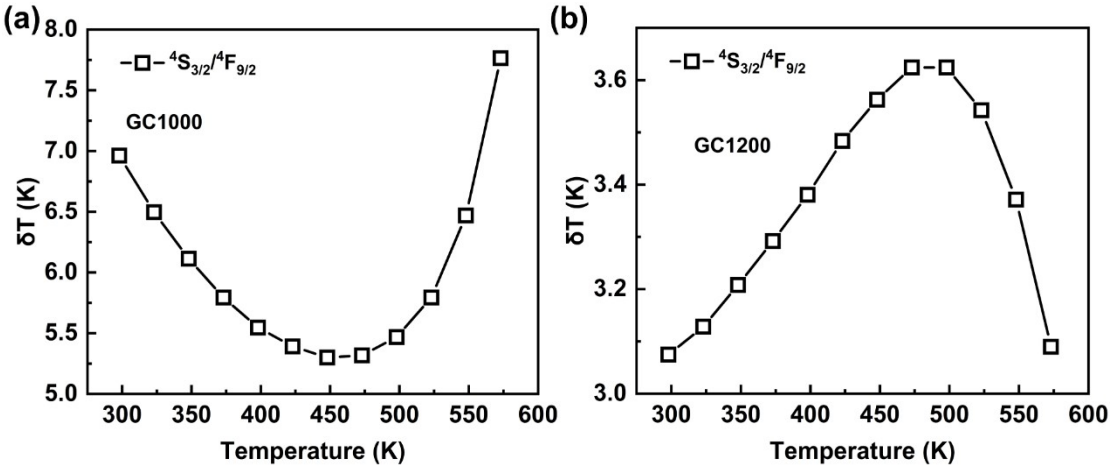

Fig. S6 Temperature resolution of NTCLs ($^4S_{3/2}/^4F_{9/2}$) of (a) GC1000 and (b) GC1200.

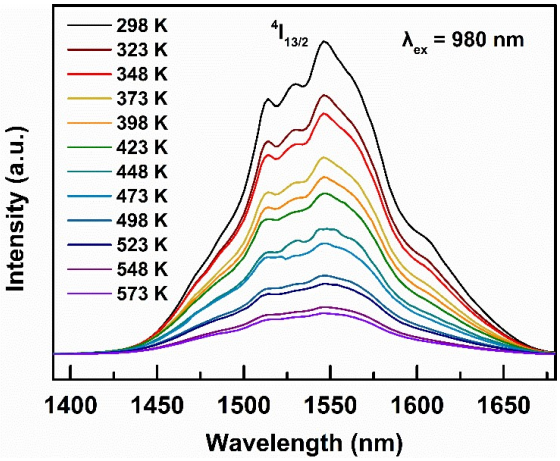

Fig. S7 Temperature dependence of NIR emission spectra of GC1000 from 298 to 573 K under the 980 nm excitation.

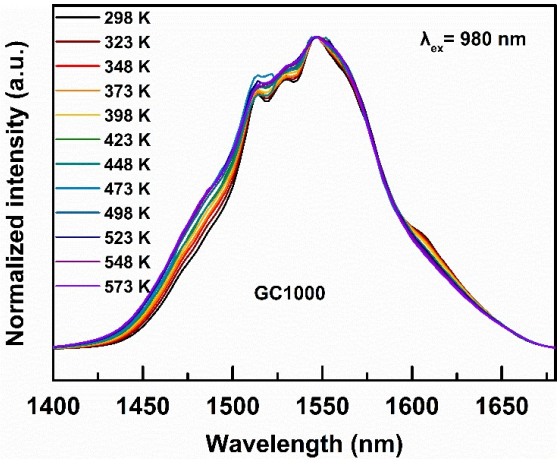

Fig. S8 Temperature dependence of normalized NIR emission spectra of GC1000 from 298 to 573 K under 980 nm excitation.

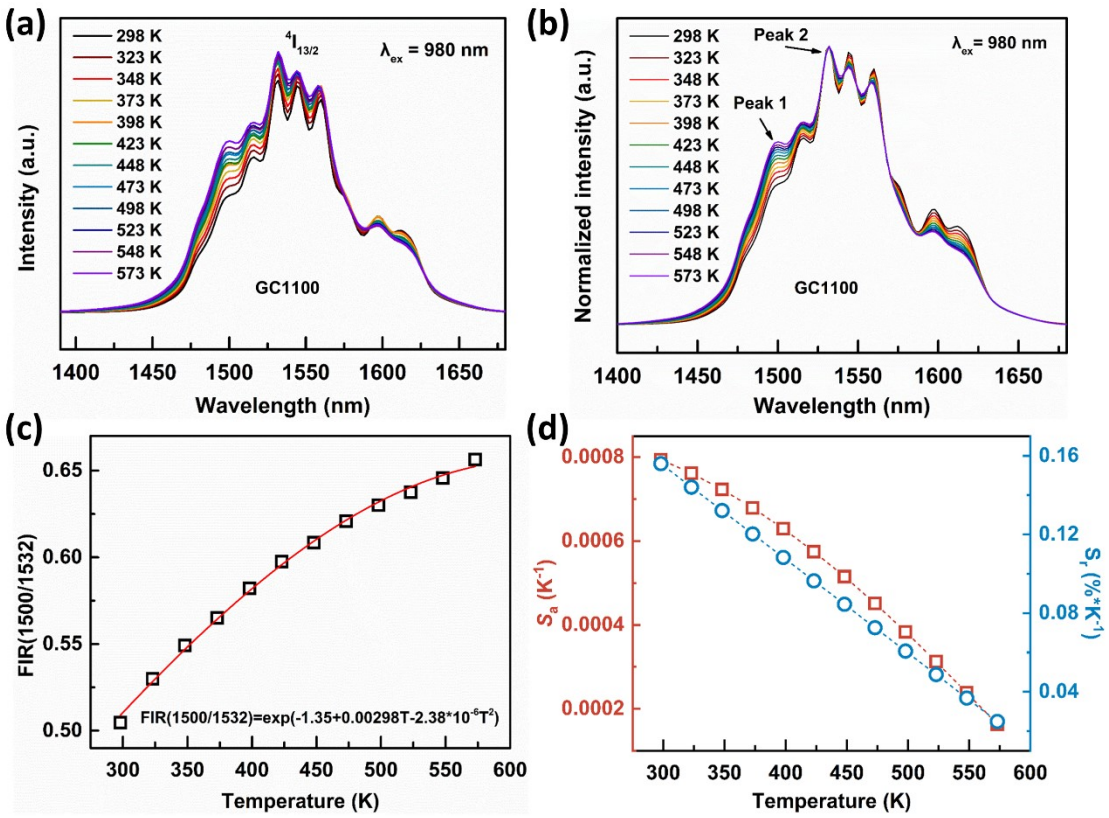

Fig. S9 Temperature dependence of (a) NIR emission spectra and (b) normalized NIR emission spectra of GC1100 from 298 to 573 K under 980 nm excitation. (c) Temperature dependence of FIR value between $^4I_{13/2}$ sublevels of Er^{3+} ions. (d) The curves of absolute sensitivity S_a and relative sensitivity S_r.

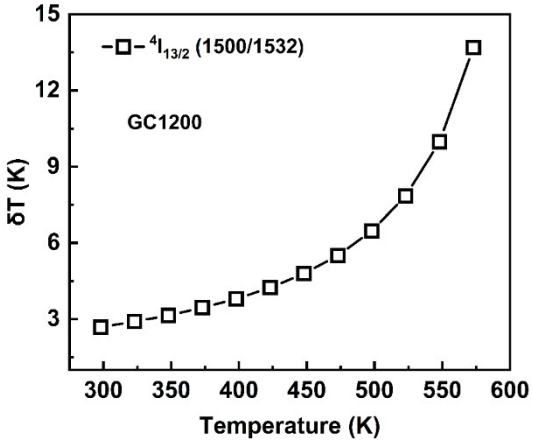

Fig. S10 Temperature resolution of the Stark sublevels ($^4I_{13/2}$) of GC1200.