

Electronic Supplementary Information (ESI) for

A photostable vitrified film based on a terbium(III) β -diketonate complex as a sensing element for reusable luminescent thermometers

Dmitry V. Lapaev,^{*a} Victor G. Nikiforov,^a Vladimir S. Lobkov,^a Andrey A. Knyazev,^b

Yury G. Galyametdinov^{ab}

^aZavoisky Physical-Technical Institute, Federal Research Center “Kazan Scientific Center of RAS”, Sibirsky trakt str., 10/7, 420029, Kazan, Russia. E-mail: d_lapaev@mail.ru

^b Kazan National Research Technological University, K. Marks str., 68, 420015, Kazan, Russia

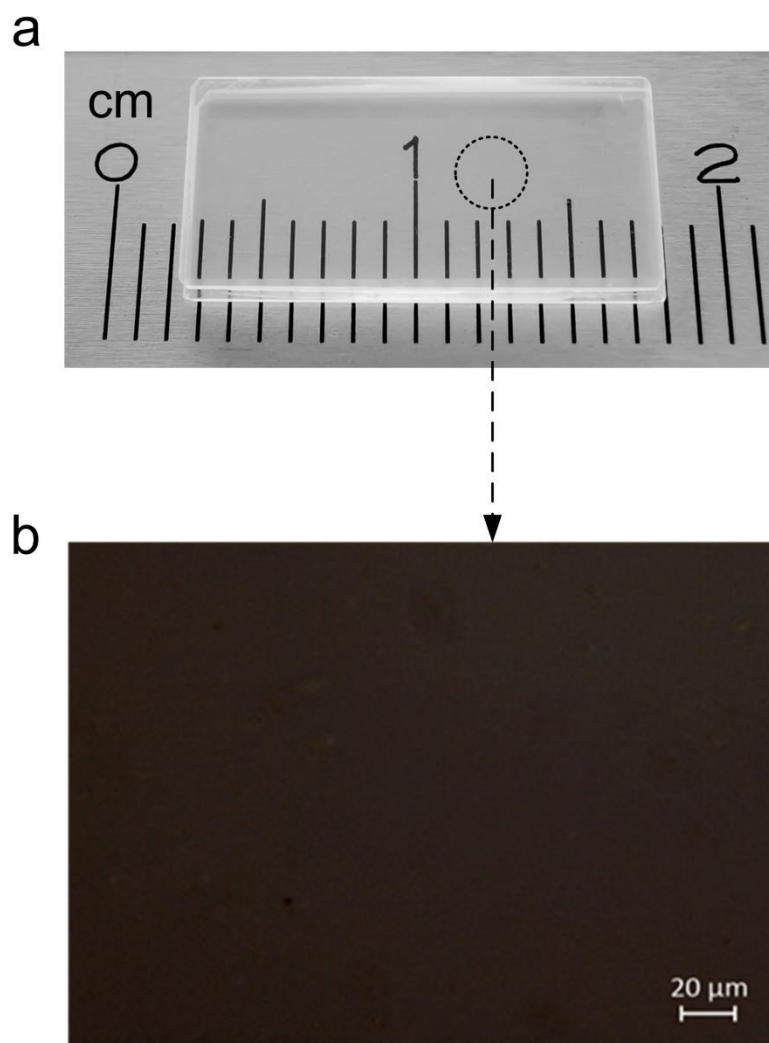


Fig. S1 (a) Photographic image of the 20 μm thick vitrified Tb(CPDK₃₋₇)₃phen film sandwiched between two quartz plates with the size of 7 × 15 × 0.5 mm in daylight. The dashed ring indicates the exposed surface area of the film. (b) Room temperature POM image of the surface area of the Tb(CPDK₃₋₇)₃phen film viewed under crossed polarizers and 500× magnification.

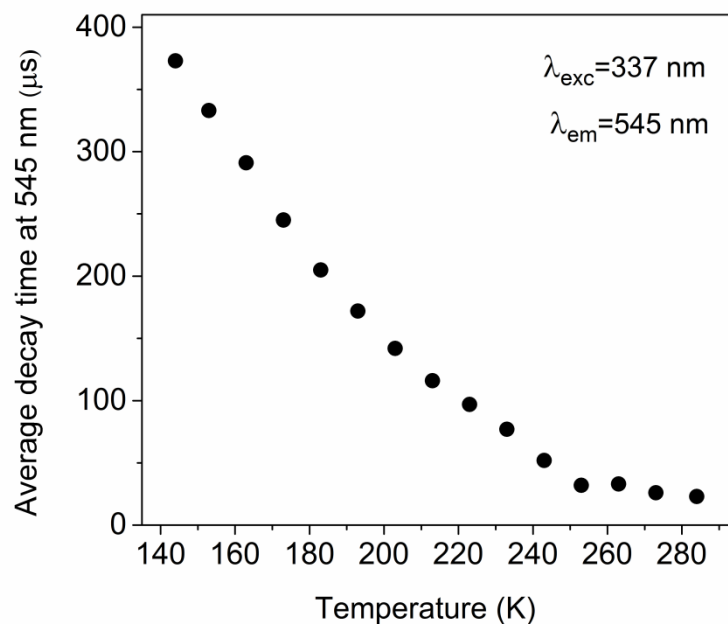


Fig. S2 Temperature dependence of the average luminescence decay time ($\lambda_{\text{exc}}=337$ nm, $\lambda_{\text{em}}=545$ nm) of the 20 μm thick vitrified Tb(CPDK₃₋₇)₃phen film.

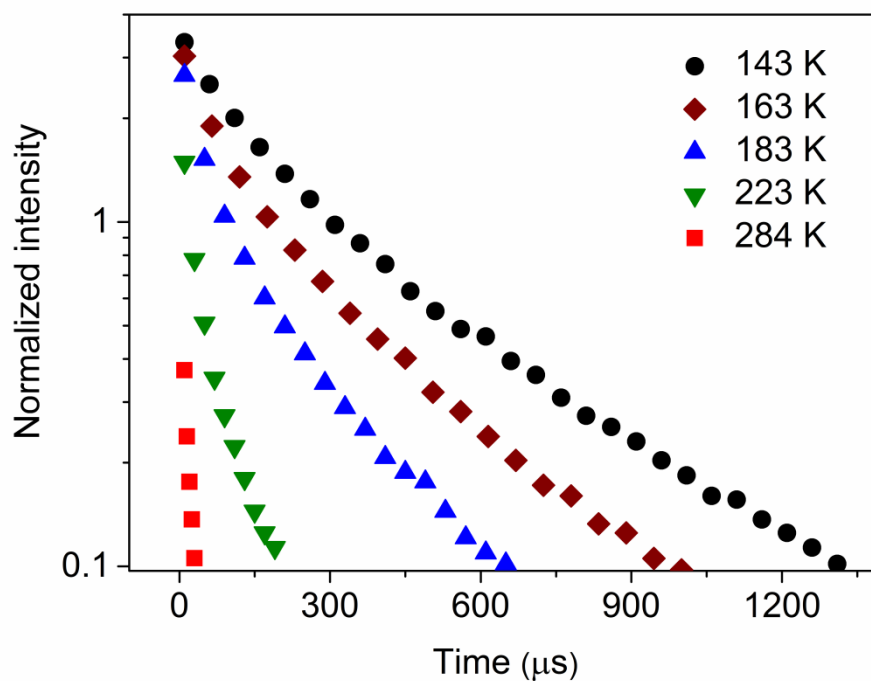


Fig. S3 Temperature dependence of the luminescence decay curve ($\lambda_{\text{exc}}=337$ nm, $\lambda_{\text{em}}=545$ nm) of the 20 μm thick vitrified Tb(CPDK₃₋₇)₃phen film.

Table S1 Parameters of the function $I(t) = \sum_{i=1}^n A_i \exp(-t/\tau_i)$ fitting the luminescence decay curve ($\lambda_{\text{em}}=545$ nm) of the 20 μm thick vitrified Tb(CPDK₃₋₇)₃phen film at different temperatures, and temperature dependences of the average luminescence decay time $\langle\tau\rangle$ and the mean luminescence intensity $\langle I \rangle$

Temperature (K)	A_1	τ_1 (μs)	A_2	τ_2 (μs)	$\langle\tau\rangle$ (μs)	$\langle I \rangle$	Correlation coefficient R^2
143	1.6±0.001	109±1.1	1.8±0.01	434±2	373±9	956±10	0.9997
153	1.7±0.01	89±1	1.6±0.01	394±2	333±10	782±10	0.9997
163	1.8±0.01	73±1	1.4±0.01	350±2	291±10	621±9	0.9994
173	1.9±0.01	57±1	1.3±0.01	298±2	245±9	496±8	0.9992
183	1.9±0.01	46±0.5	1.1±0.01	257±2	205±9	370±6	0.9992
193	1.9±0.01	38±0.5	0.9±0.01	221±2	172±8	271±5	0.9988
203	1.9±0.01	31±0.3	0.7±0.01	190±2	142±8	192±4	0.9987
213	1.7±0.01	26±0.4	0.6±0.01	159±2	116±8	140±4	0.9985
223	1.6±0.01	22±0.3	0.5±0.01	137±2	97±8	104±3	0.9984
233	1.4±0.01	18±0.3	0.4±0.01	113±2	77±7	70±2	0.9983
243	1.2±0.01	14±0.3	0.4±0.01	75±2	52±6	47±2	0.9993
253	1.2±0.04	9±0.4	0.4±0.02	49±2	33±7	30±3	0.9988
263	1±0.02	10±0.4	0.3±0.02	49±3	33±9	25±2	0.9992
273	0.9±0.04	8±0.5	0.2±0.02	38±2	26±8	15±2	0.9985
284	0.8±0.04	7±0.4	0.2±0.01	35±1	23±5	13±1	0.9985