ALL NEAR-INFRARED MULTIPARAMETRIC LUMINESCENCE THERMOMETRY USING Er³⁺, Yb³⁺-DOPED YAG NANOPARTICLES

Jovana Periša¹, Zoran Ristić¹, W. Piotrowski², Željka Antić¹, Lukasz Marciniak², Miroslav D.

Dramićanin^{1,*}

¹Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, Belgrade 11001, Serbia.
²Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Okólna

2, 50-422 Wroclaw, Poland

*Corresponding author E-mail: dramican@vinca.rs (M.D. Dramićanin)

Table S1 Selected structural parameters of synthesized YAG:Yb³⁺ and YAG:Yb³⁺,Er³⁺ nanocrystals determined using Rietveld refinement method based on XRD patterns

	YAG:10Yb	YAG:10Yb1Er	YAG:10Yb2Er
Crystallite size [nm]	23.4 (3)	18.8 (3)	17.9 (4)
Strain [%]	0.30 (3)	0.15 (4)	0.24 (11)
Rwp [%]	5.67	6.98	6.35
Rp [%]	4.23	5.06	4.78
Re [%]	2.93	2.90	2.92
GOF	1.9533	2.4105	2.1731
a [Å]	12.0197 (5)	12.0326 (6)	12.0323 (6)
b[Å]	12.0197 (5)	12.0326 (6)	12.0323 (6)
c[Å]	12.0197 (5)	12.0326 (6)	12.0323 (6)



Figure S1 Photoluminescence emission spectra of a) YAG:10Yb1Er and b) YAG:10Yb2Er samples recorded in 80 - 600 K temperature range under 940 nm excitation; c) Temperature dependence of Yb³⁺ ions emission for both samples and d) Temperature dependence of Er³⁺ ions emission for both samples.



Figure S2 Calculation based on total Er^{3+} emission: Photoluminescence emission spectra of a) YAG:10Yb1Er and b) YAG:10Yb2Er samples recorded in 80 – 600 K temperature range under 940 nm excitation. Thermometric properties of YAG:10Yb1Er (green line) and YAG:10Yb2Er (pink line) samples: c) experimental (symbols) and theoretical (full line) temperature-dependent luminescence intensity ratio (ln (LIR_{Yb/Er})), d) absolute (S_A) and relative (S_R) sensitivities obtained by LIR_{Yb/Er} temperature read-out.