

Supporting information

Up-conversion emission and *in vitro* cytotoxicity characterization of blue emitting, biocompatible SrTiO₃ nanoparticles activated with Tm³⁺ and Yb³⁺ ions

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Table s1. Comparison of crystallite size estimated using Scherrer's method and TEM analysis

Sample	Crystallite size based on Scherrer's method (nm)	Particle size based on TEM (nm)
600 °C	18	20
700 °C	19	25
800 °C	22	30
900 °C	26	42
1000 °C	38	90

SEM-EDS analysis

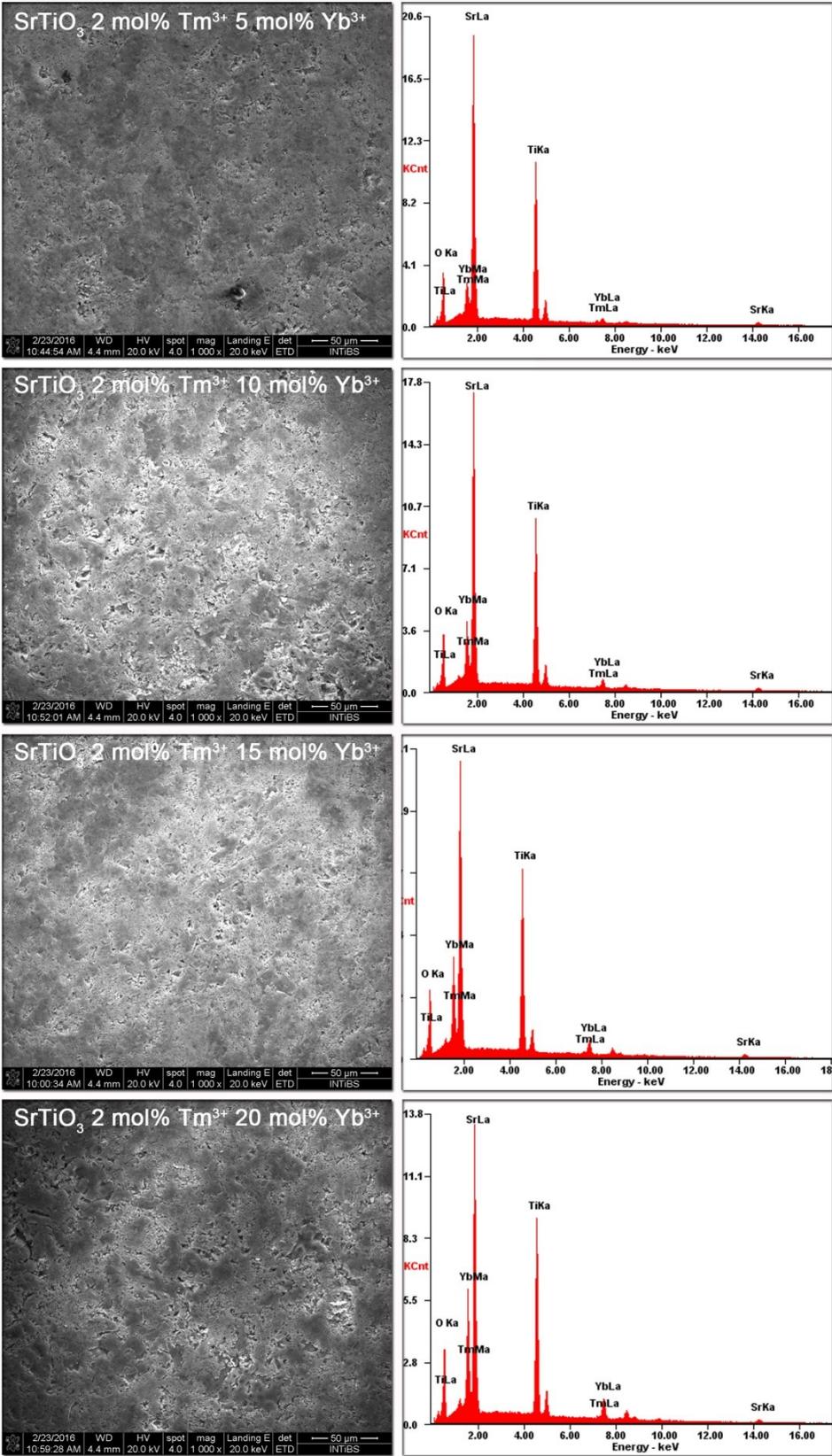


Figure s1. Representative data of SEM-EDS measurements of the SrTiO₃ 2 mol% Tm³⁺ x mol% Yb³⁺ nanoparticles

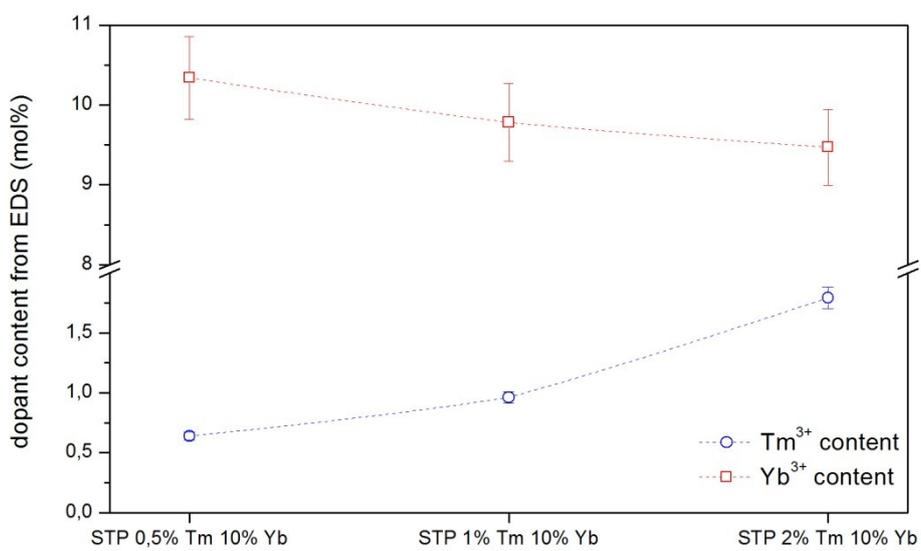
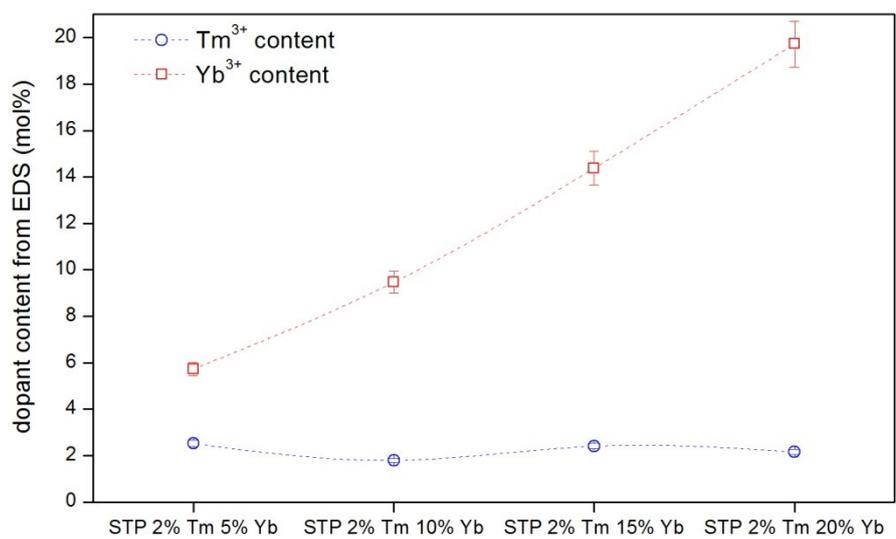


Figure s2. Representative data of EDS analysis of the SrTiO₃ nanoparticles (upper) 2 mol% Tm³⁺ x mol% Yb³⁺, (bottom) x mol% Tm³⁺ 10 mol% Yb³⁺

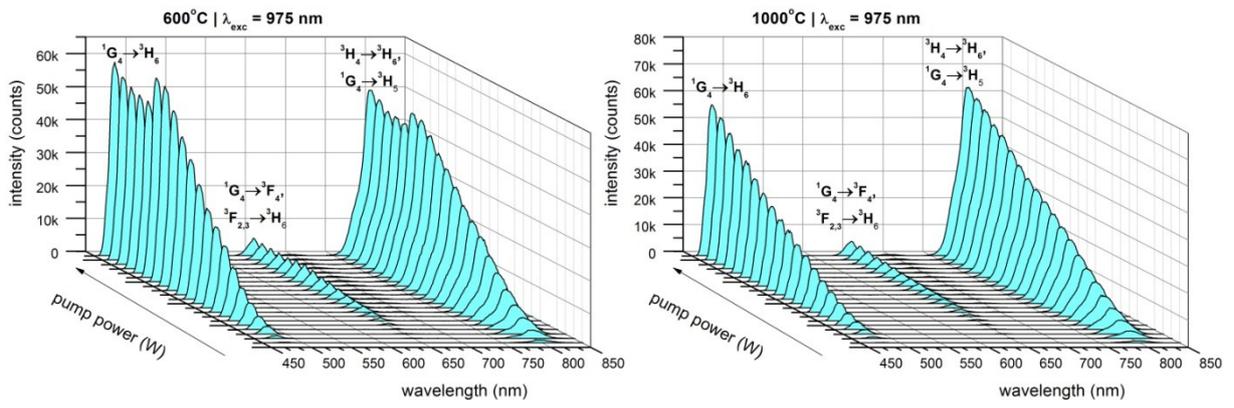
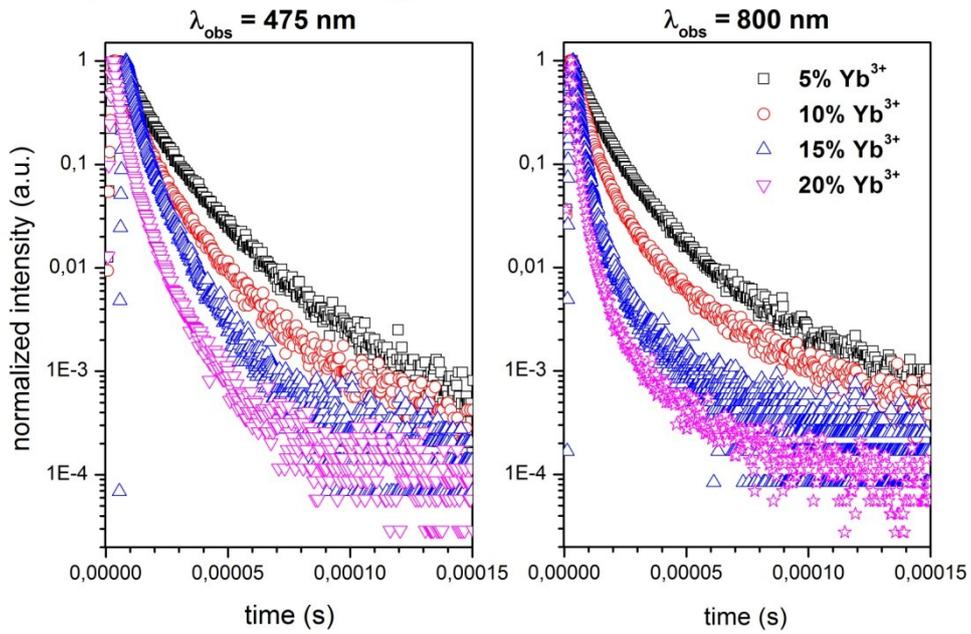


Figure s3. Representative power dependence spectra of the SrTiO₃ nanoparticles doped with 0.5 mol% Tm³⁺ and 5 mol% Yb³⁺ ions as a function of annealing temperature (600 °C and 1000 °C).

SrTiO₃: 0.5% Tm³⁺ / x% Yb³⁺ $\lambda_{exc} = 975$ nm



SrTiO₃: x% Tm³⁺ / 5% Yb³⁺ $\lambda_{exc} = 975$ nm

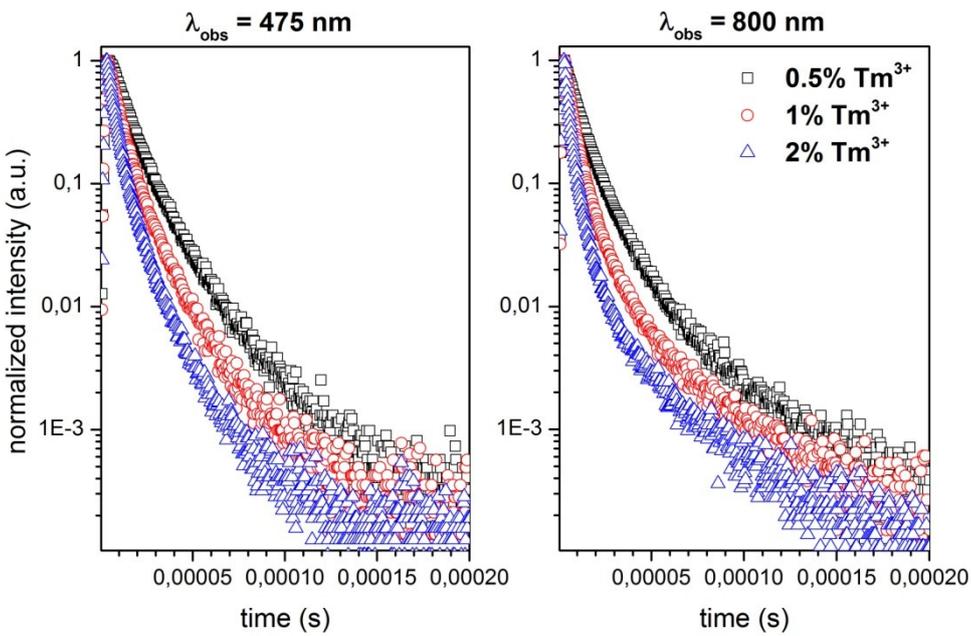


Figure s4. Effect of Tm³⁺ (up) and Yb³⁺ (bottom) doping on decay curves of blue and red emission of the SrTiO₃ particles.

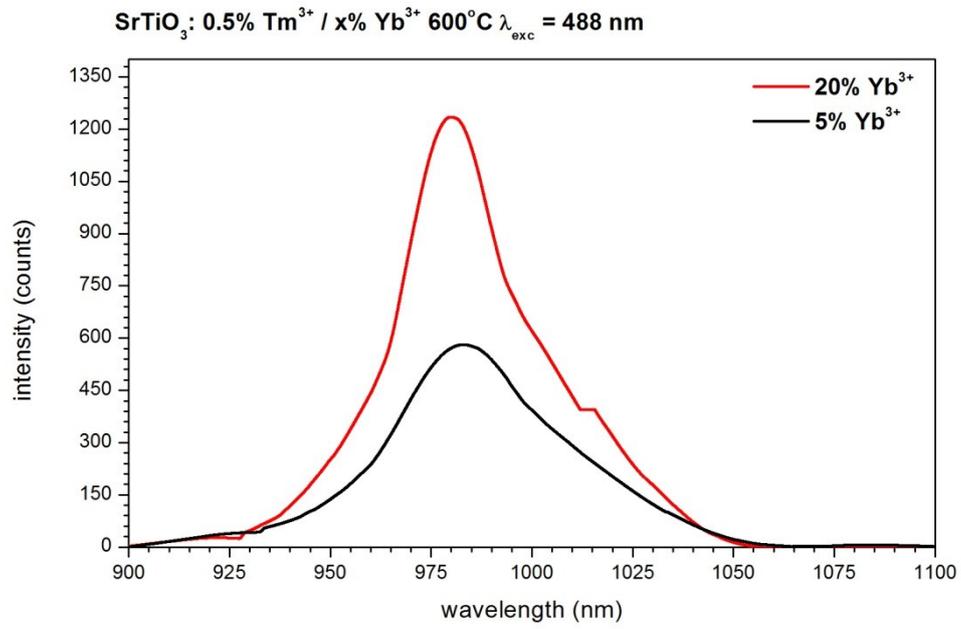


Figure s5. Back-transfer of Tm³⁺ to Yb³⁺ of SrTiO₃ nanoparticles sintered at 600°C upon direct excitation of Tm³⁺ with 488 nm laser line.