

Supporting information

Ion-ion interactions in β -NaGdF₄:Yb³⁺, Er³⁺ nanocrystals – effect of ions concentration and their clustering

Agnieszka Noculak, Artur Podhorodecki*, Grzegorz Pawlik, Mateusz Banski, Jan Misiewicz

Department of Experimental Physics, Wrocław University of Technology, Wyb. Wyspińskiego 27, 50-370 Wrocław, Poland

*Corresponding author: e-mail: artur.p.podhorodecki@pwr.edu.pl

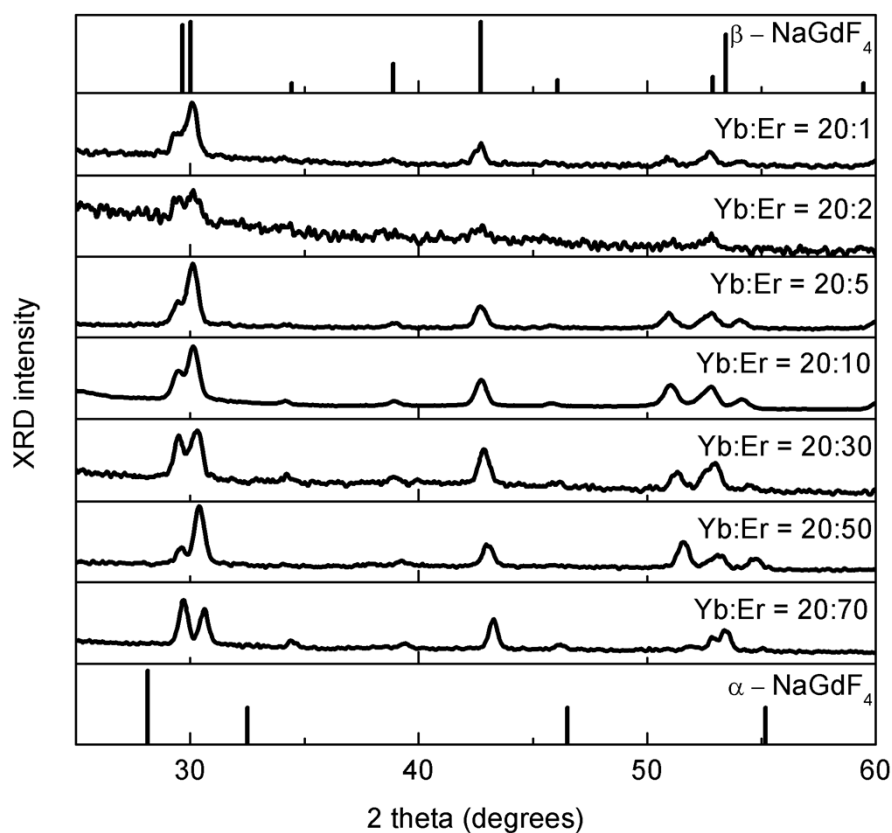


Figure 1S. XRD results of NaGdF₄:Yb³⁺, Er³⁺ RENCs with different Er³⁺ ions concentration

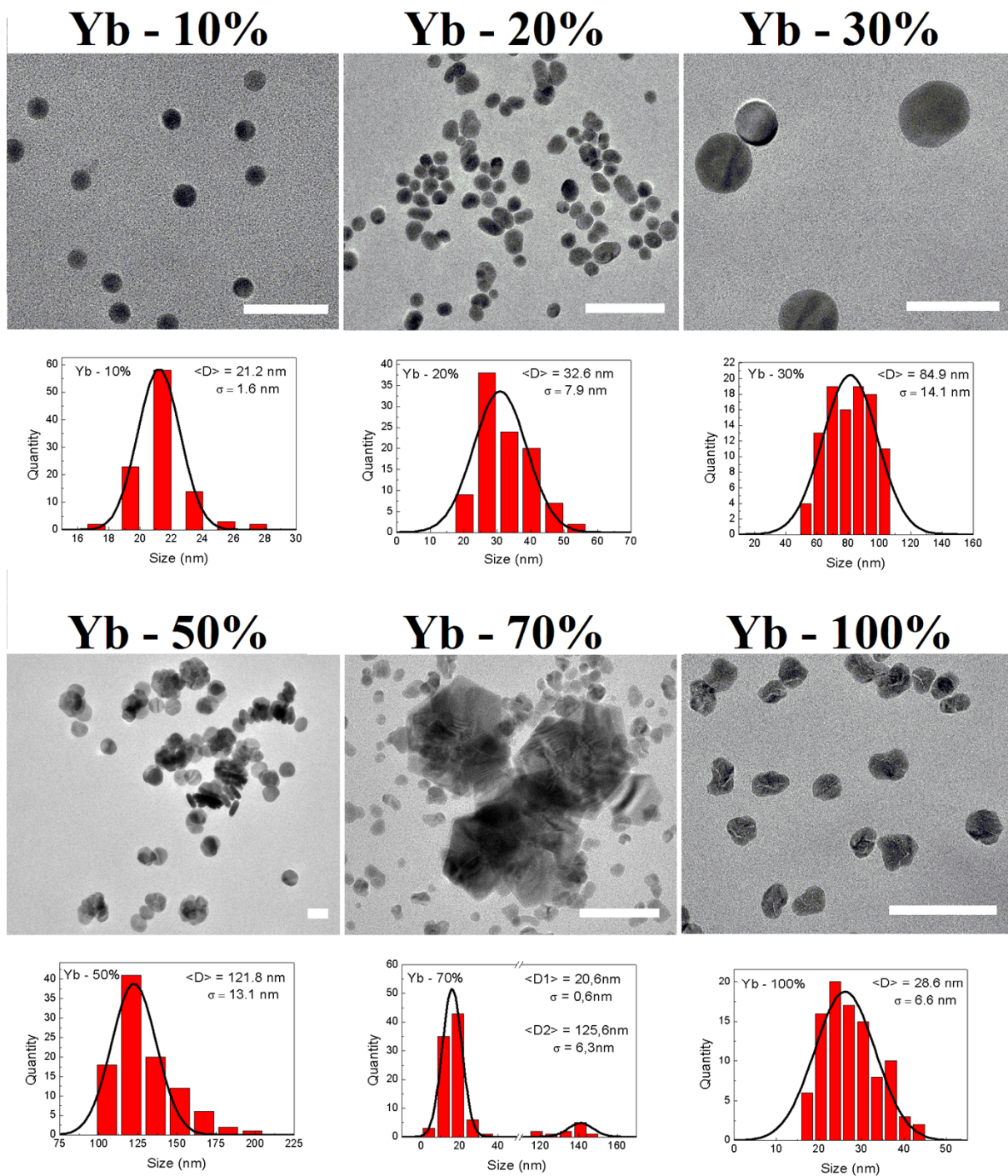


Figure 2S. TEM images and histograms of RENCs with different Yb^{3+} concentrations ($\text{Er}^{3+} = 5\%$) – scale bare = 100 nm

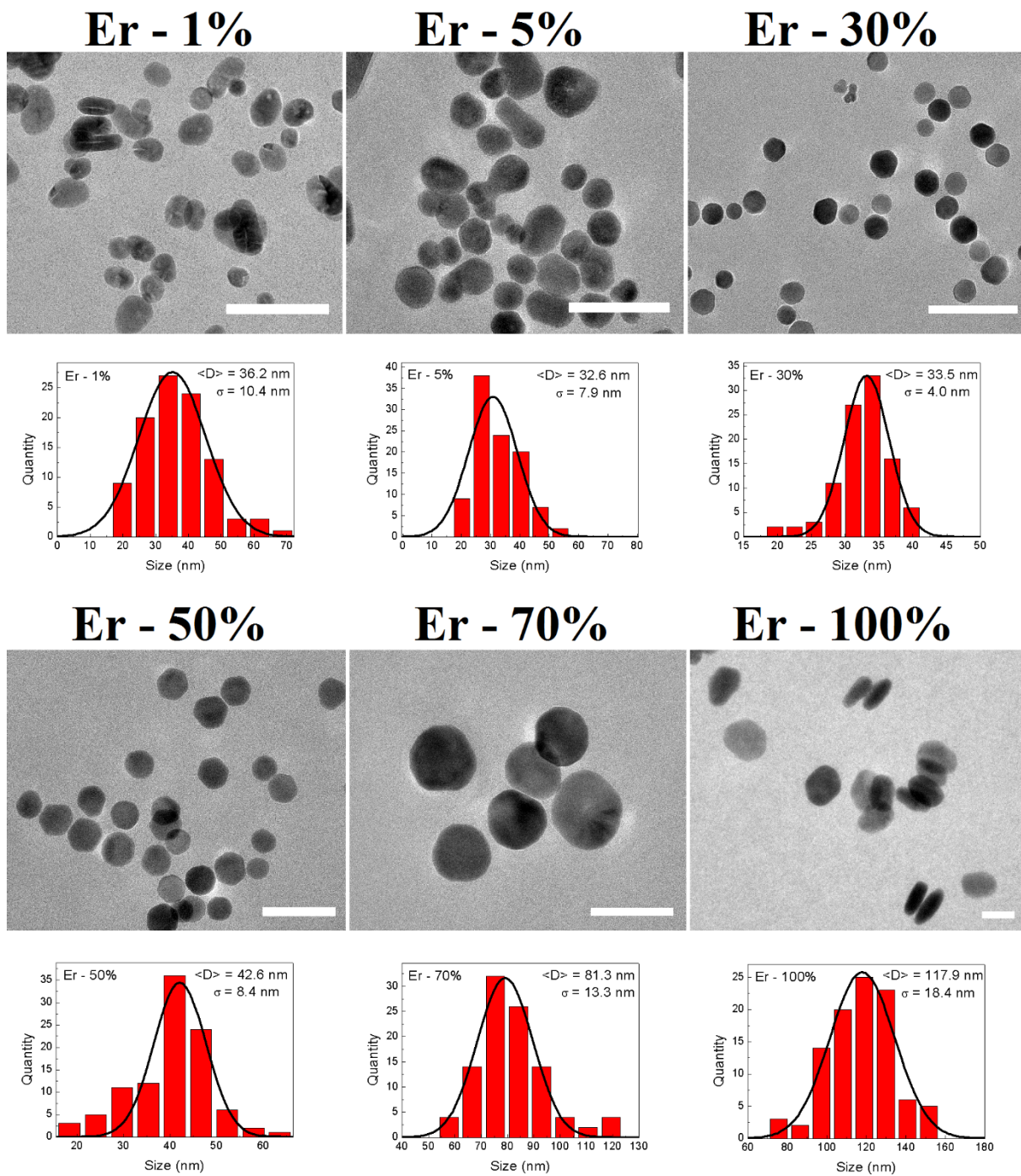


Figure 3S. TEM images and histograms of RENCs with different Er³⁺ concentrations (Yb³⁺ = 20%) – scale bar = 100 nm

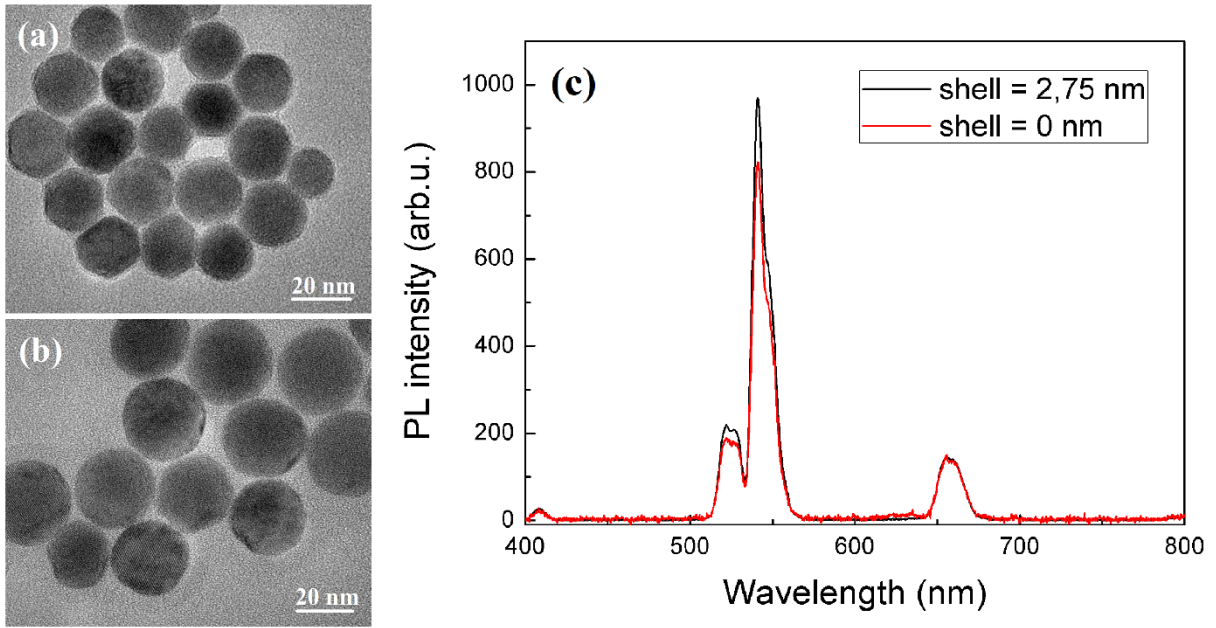


Figure 4S. TEM images of $\text{NaGdF}_4:\text{Yb}^{3+},\text{Er}^{3+}$ core RENCs (a), $\text{NaGdF}_4:\text{Yb}^{3+},\text{Er}^{3+}/\text{NaGdF}_4$ core-shell RENCs and PL emission from both kinds of RENCs