Supplementary Material (ESI) for CrystEngComm

Supporting Information

Size and shape control of up-converting nanoparticles using microwave assisted synthesis

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General synthesis procedure for AYF4:Yb, Er (with A = Na, Li)

Upconverting nanoparticles AYF_4:Yb, Er (with A = Na, Li) were synthesized with the procedure described in the experimental section in the manuscript. In a typical process, 78.47 mg of Na-TFA, 177.76 mg of Y-TFA, 42.54 mg of Yb-TFA and 4.22 mg of Er-TFA were dissolved in 6 ml mixture of OA and ODE (v:v=1:1). First, the solution was stirred and heated to 100 °C, repeatedly degassed and purged with nitrogen. Then, the degassed solution was transferred into the reacting vessel of the Discover LabMate microwave reactor (CEM, USA) and heated to 290 °C for 20 minutes by microwave irradiation. The upconverting nanocrystals were collected by centrifugation when the reaction mixture

was cooled down to room temperature, and washed with ethanol. The obtained upconverting nanocrystals were finally dissolved in chloroform or toluene for further experiments.

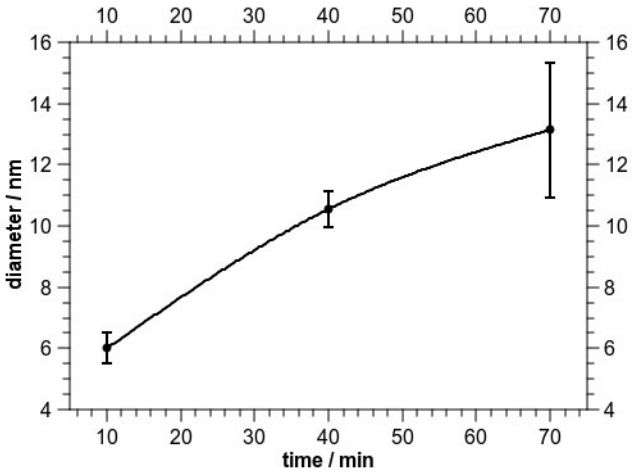

Figure S1. Different NaYF4:Yb^{3+}, Er^{3+} nanocrystal sizes obtained by different reaction times.

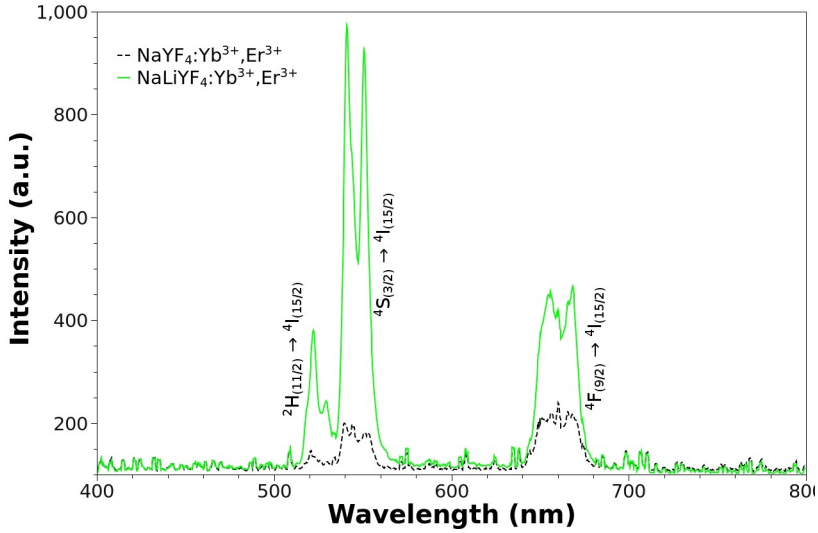

Figure S2. Upconversion photoluminescence spectra of $NaYF_4$:Yb^{3+}, Er^{3+} (dashed, black) and $Na_{1-x}Li_xYF_4$:Yb^{3+}, Er^{3+} (solid, green) nanoparticles, recorded by adapting a 980 nm laser diode (70 mW, Roither Lasertechnik, Vienna, Austria) and a home-built curvette holder to a fibre spectrometer (USB2000, OceanOptics, USA). The detector was protected from scattered excitation light by means of a 950 nm low-pass filter (Edmund Optics, Karlsruhe, Germany).

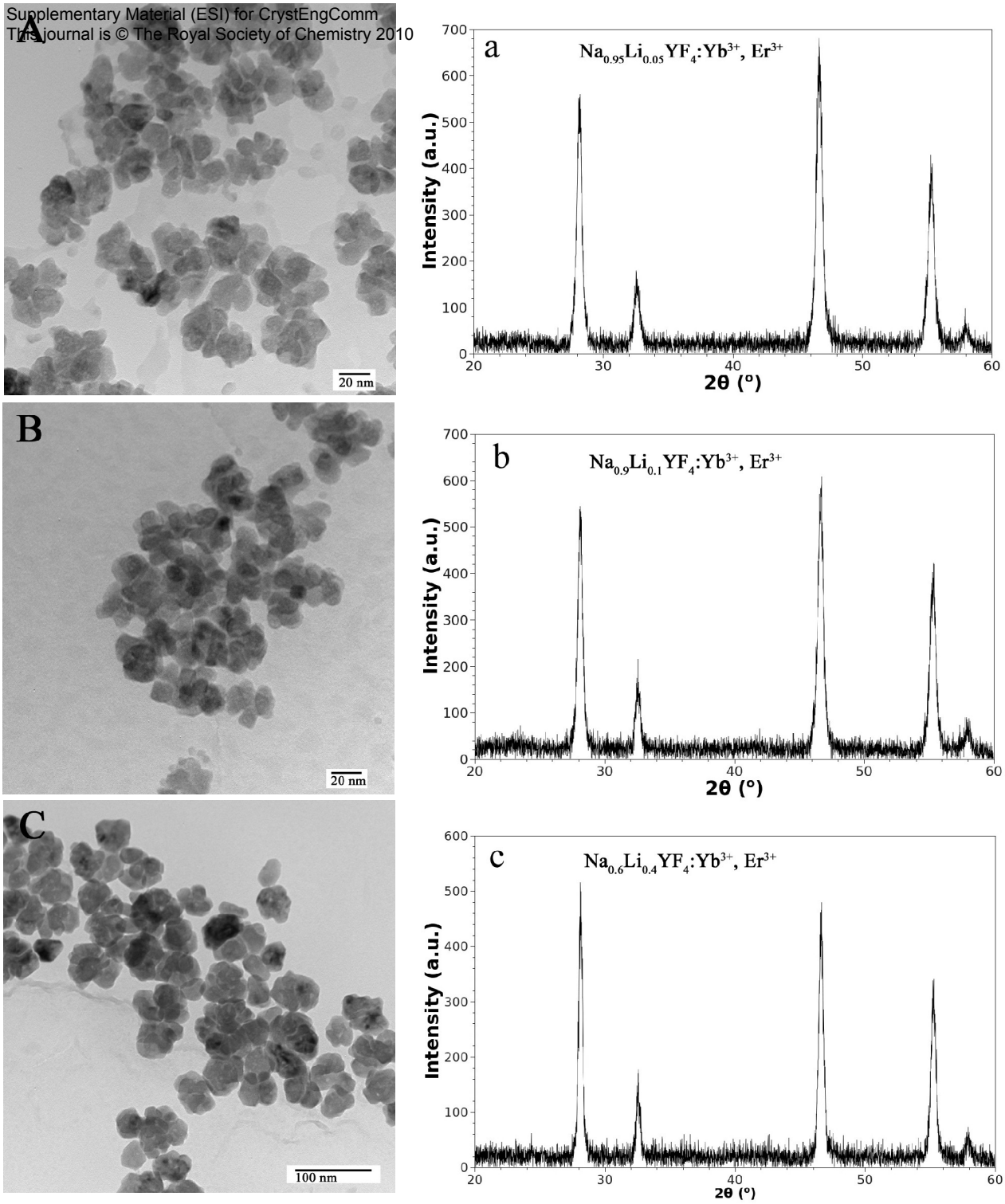

Figure S3. TEM micrographs and their corresponding XRD patterns of nanocrystals with lithium ratios below 50%. A) 5% lithium, B) 10% lithium, C) 40% lithium.

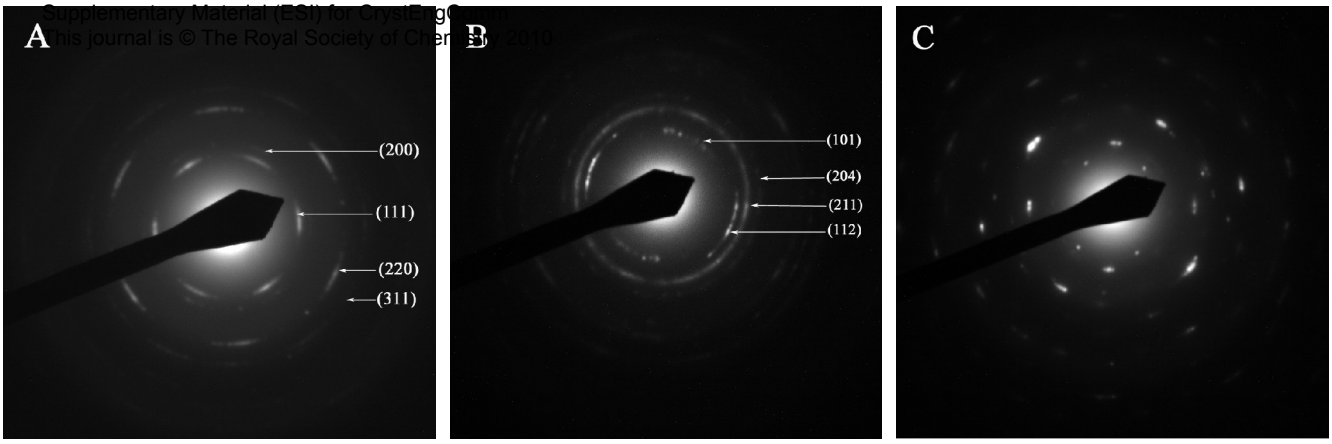

Figure S4. SAED pattern of A) flower-like nanocrystal, B) nanowire bundle, and C) rhombic nanocrystal.