Supplementary Information

Decrease in particle size and enhancement of upconversion emission through $Y^{3+}$ ions doping in hexagonal NaLuF$_4$:Yb$^{3+}$/Er$^{3+}$ nanocrystals

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Fig. S1 The standard XRD data of $\beta$-NaYF$_4$ (JCPDS 16-0334) and the XRD patterns of Y-all.

Fig. S2 The SEM image of Y-all.

Fig. S3 The decay curve for Eu$^{3+}$ $^5D_0$ level of $\beta$-NaLu$_{0.68}$Y$_{0.3}$Eu$_{0.02}$F$_4$. 