Electronic Supplementary Material (ESI) for Nanoscale

Supporting information

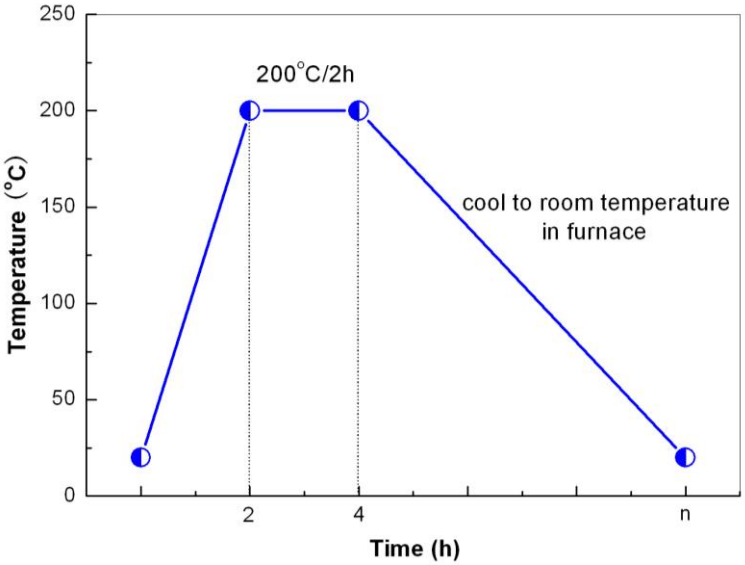

Fig.S1. Temperature schedule of the preparation of $NaGd(Y)_{1-x}Yb_xF_4$ nanocrystals by hydrothermal routine.

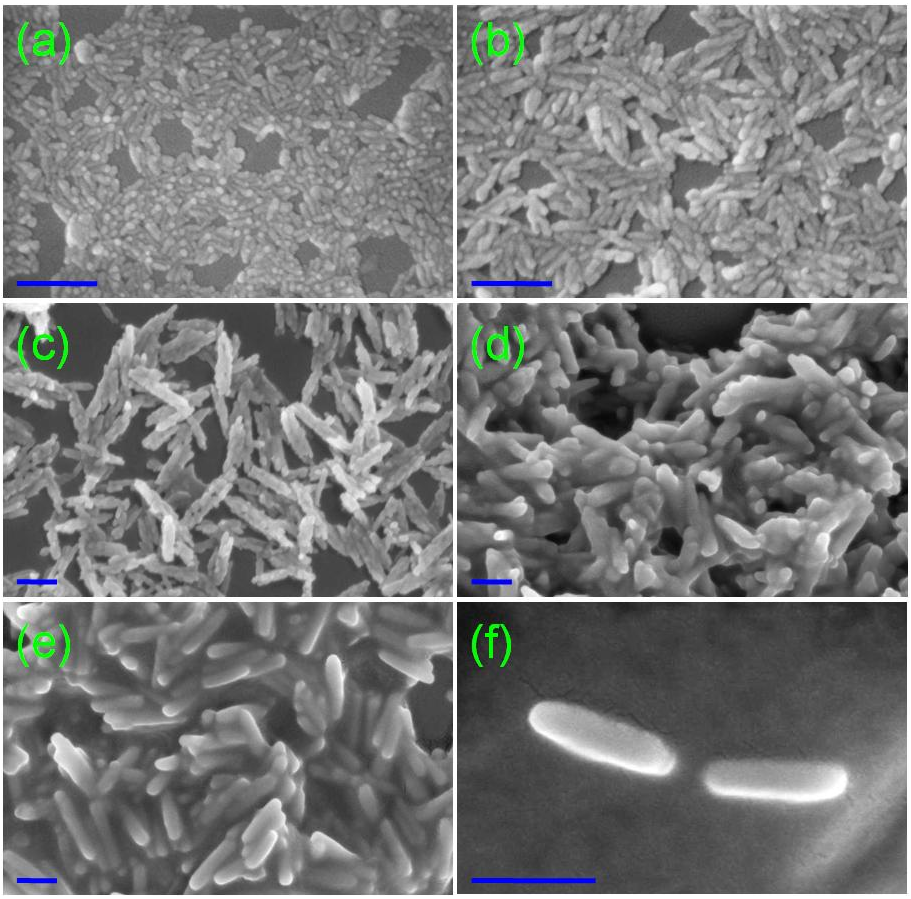

Fig.S2. SEM images of $NaGd_{1-x}Yb_xF_4$ nanocrystals. (a) x=0.2, (b) x=0.4, (c) x=0.6, (d) x=0.8, (e) x=0.9, (f) x=0.9. All the scale bar is 200nm.

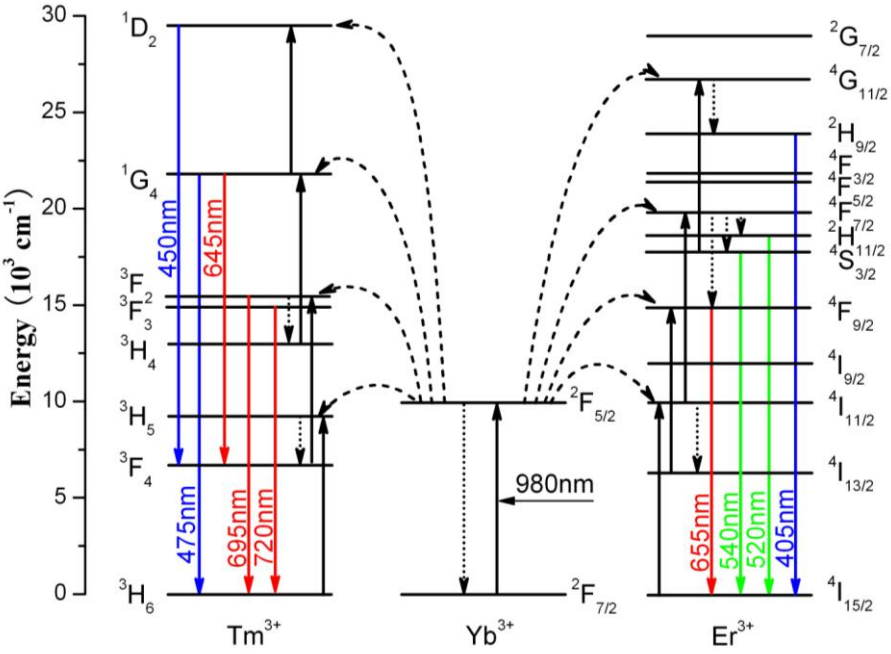

Fig.S3. Schematic energy level diagram of up-conversion luminescence of Er^{3+}/Yb^{3+}(Tm^{3+}/Yb^{3+}) ions.

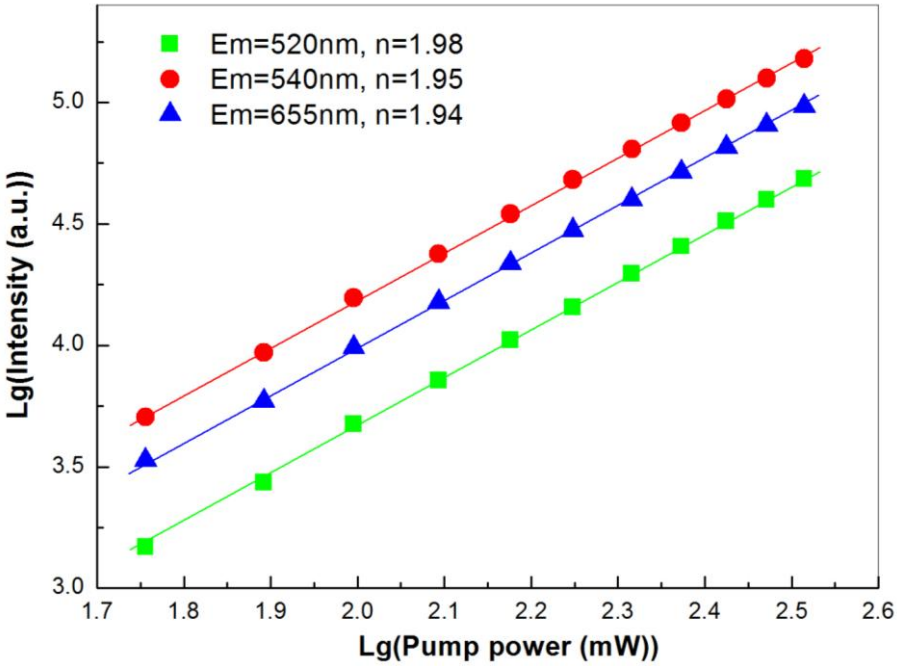

Fig.S4. Log-log relationship between the up-conversion luminescence intensity and excitation power of $NaY_{0.49}Yb_{0.5}Er_{0.01}F_4$ nanocrystals.

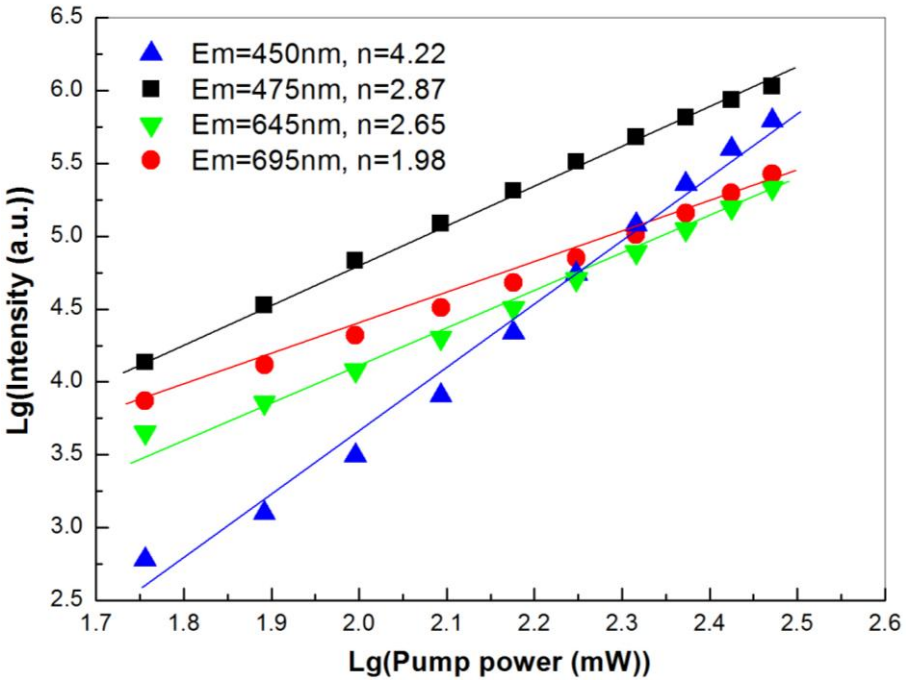

Fig.S5. Log-log relationship between the up-conversion luminescence intensity and excitation power of $NaY_{0.49}Yb_{0.5}Tm_{0.01}F_4$ nanocrystals.

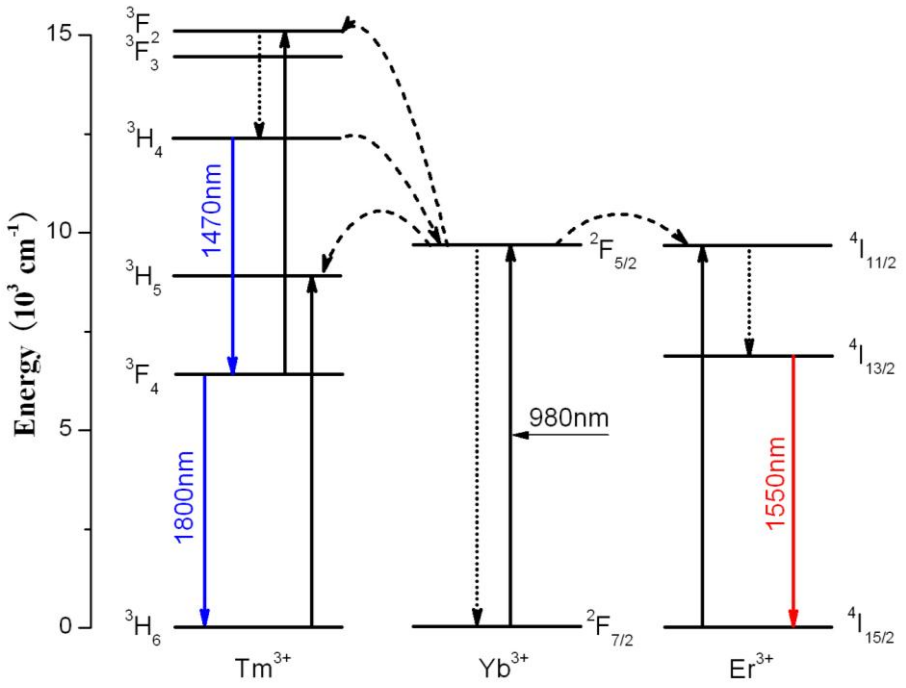

Fig.S6. Schematic energy level diagram of near-infrared (NIR) luminescence of Er^{3+}/Yb^{3+}(Tm^{3+}/Yb^{3+}) ions.

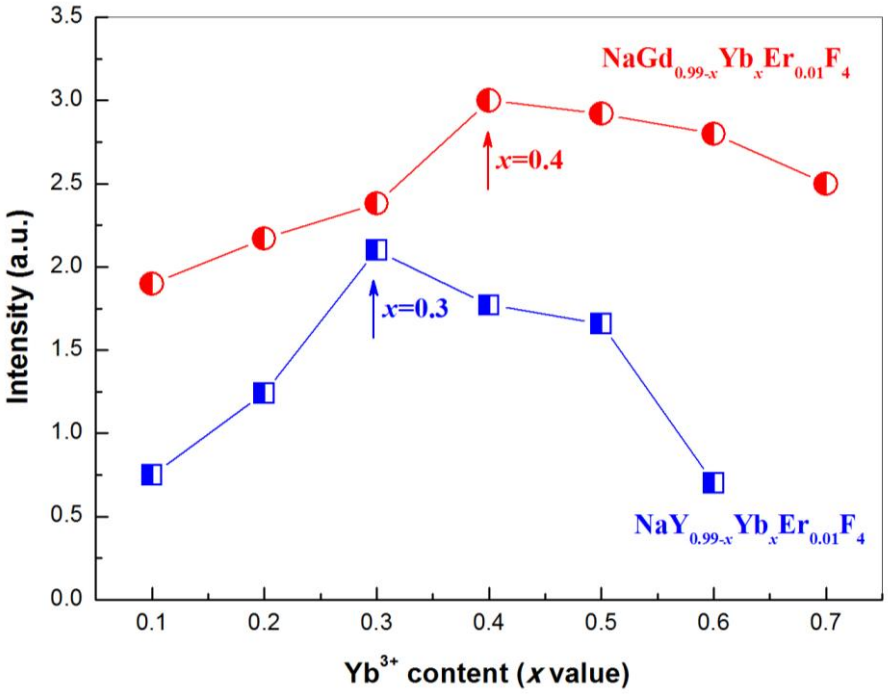

Fig.S7. The dependence of integrated luminescence intensity of 1535 nm emission on Yb^{3+} content (*x* value) of $NaY_{0.49}Yb_{0.5}Er_{0.01}F_4$ and $NaGd_{0.49}Yb_{0.5}Er_{0.01}F_4$ nanocrystals.