Supporting Information

Hot electron and thermal effects in plasmonic catalysis of nanocrystal transformation

Chengyun Zhang, Ting Kong, Zhengkun Fu, Zhenglong Zhang and Hairong Zheng**

School of Physics and Information Technology, Shaanxi Normal University, Xi'an 710062, China

E-mail: zlzhang@snnu.edu.cn; hrzheng@snnu.edu.cn

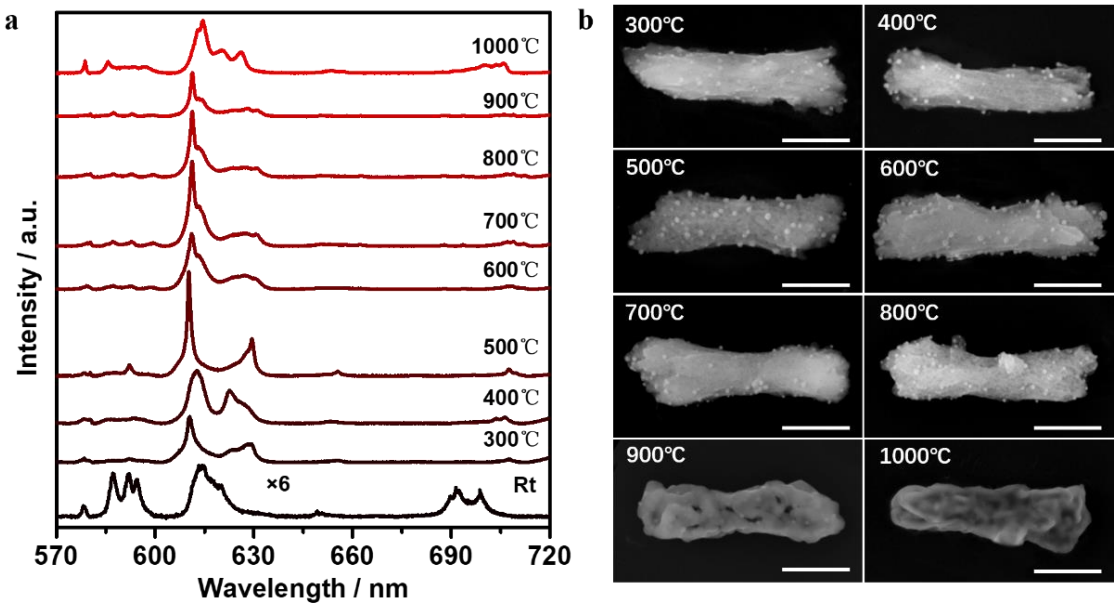

Fig. S1 Conventional thermal annealing of single YF_3:Eu^{3+}@Au bundle-like particle. (a) Corresponding luminescence spectra and (b) SEM images after thermal annealing for one hour at different temperatures. Evolution of the luminescence spectra of annealed single YF_3:Eu^{3+}@Au particle is similar to that annealed single YF_3 particle. Therefore, the decorated Au NPs will not significantly impact the material transformation during thermal annealing.

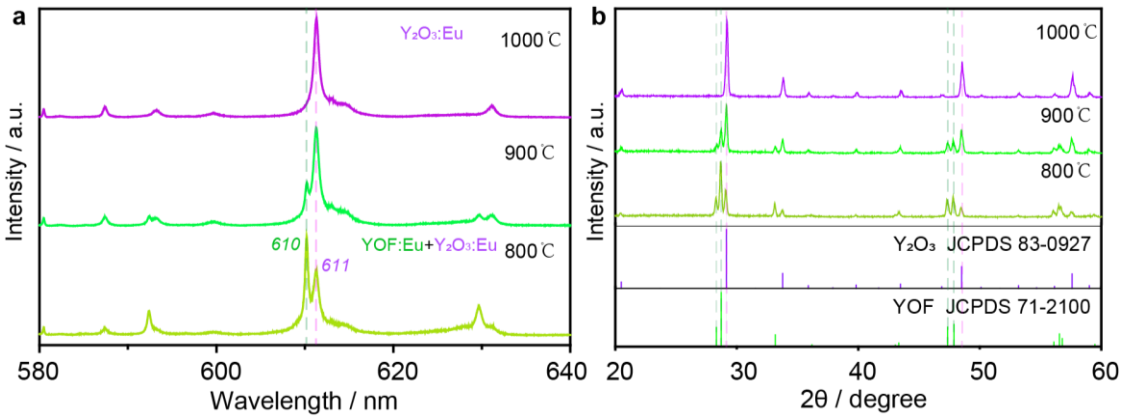

Fig. S2 Conventional thermal annealing of $YF_3:Eu^{3+}$ powder. (a) Corresponding luminescence spectra and (b) XRD spectra after thermal annealing for one hour at different temperatures, and the standard patterns of YOF with Hexagonal R-3m structure (JCPDS No.71-2100), and Y_2O_3 with Cubic Ia-3 structure (JCPDS No.83-0927). The luminescence spectrum of the product annealed at 800°C, shows two characteristic peaks that correspond to Hexagonal phase $YOF:Eu^{3+}$ (610 nm) and Cubic phase$Y_2O_3:Eu^{3+}$(611 nm)The XRD result confirm that the product annealed at 800°C is a mixture of YOF and Y_2O_3. When the annealing temperature increase to 1000°C, the emission peak of $YOF:Eu^{3+}$ (610 nm) disappeared, only shows the characteristic peak of $Y_2O_3:Eu^{3+}$(611 nm), and XRD result also confirm that the final product is pure Cubic phase Y_2O_3.