

Supporting information

Hydrothermal-assisted crystallization for synthesis of upconversion nanoparticles/CdS/TiO₂ composite nanofibers by electrospinning

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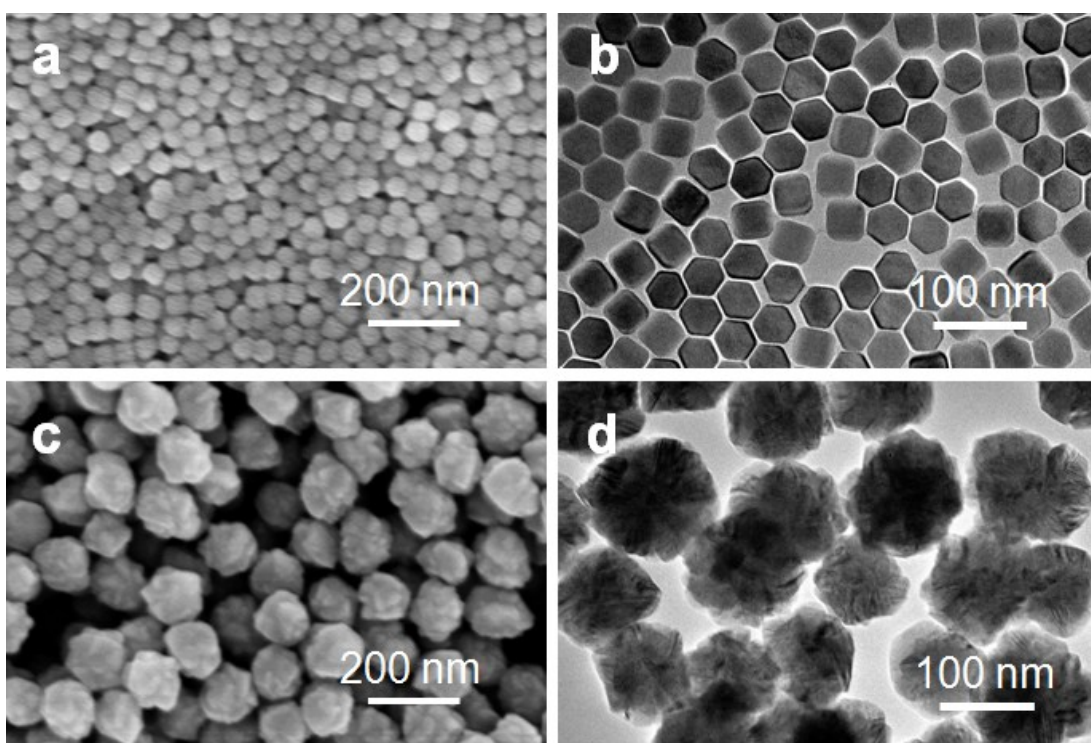


Fig. S1. (a, b) SEM and TEM images of NaYF₄:Yb/Tm@NaYF₄ core-shell nanoparticles; (c, d) SEM and TEM images of CdS nanospheres with 100 nm in diameter.

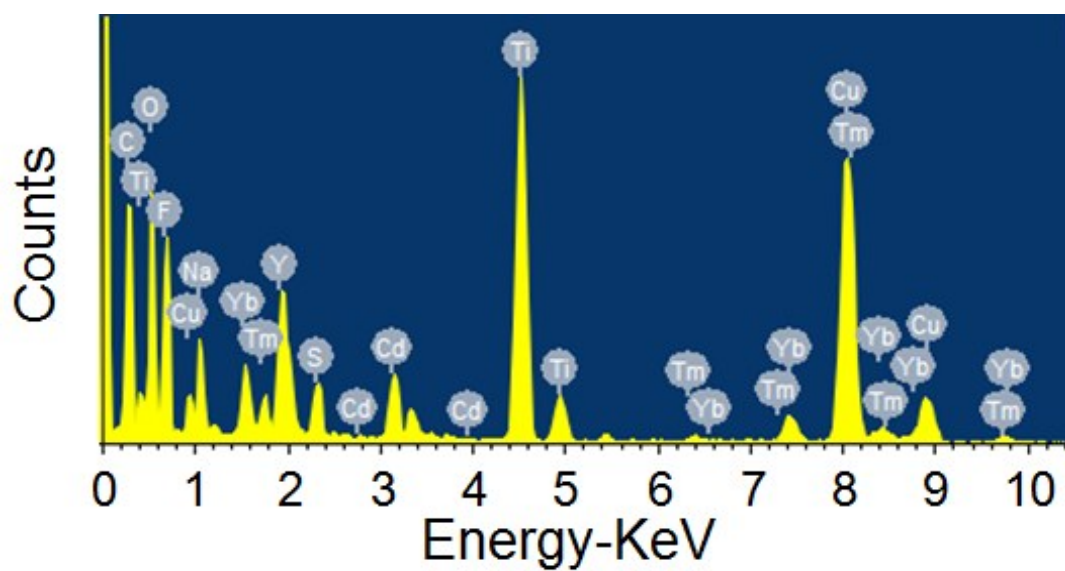


Fig. S2. The energy dispersive X-ray (EDX) analysis for as-prepared UCNPs/PVP/CdS/TBT nanofibers.

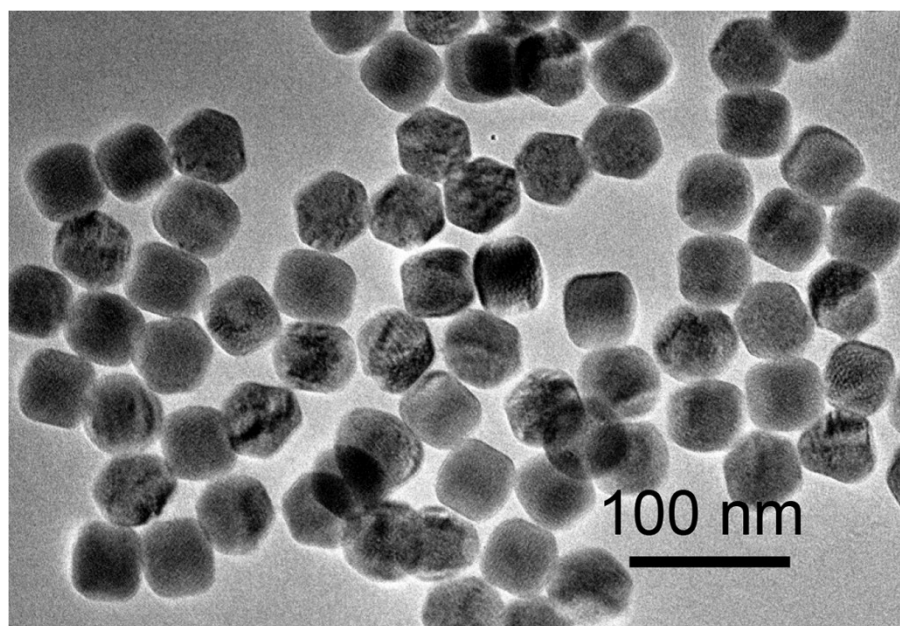


Fig. S3. TEM image of $\text{NaYF}_4\text{:Yb/Tm@NaYF}_4$ core-shell nanoparticles obtained after hydrothermal treatment at 180 °C for 12h.

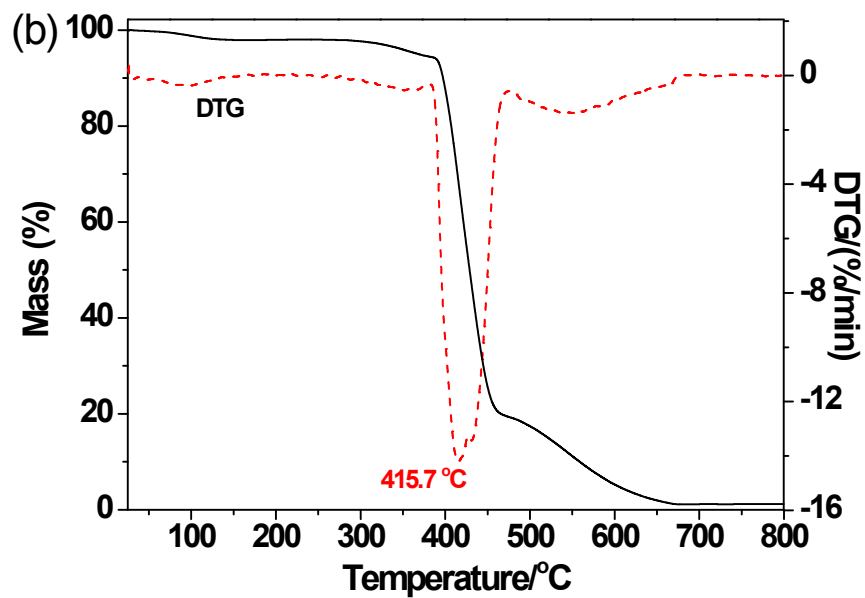
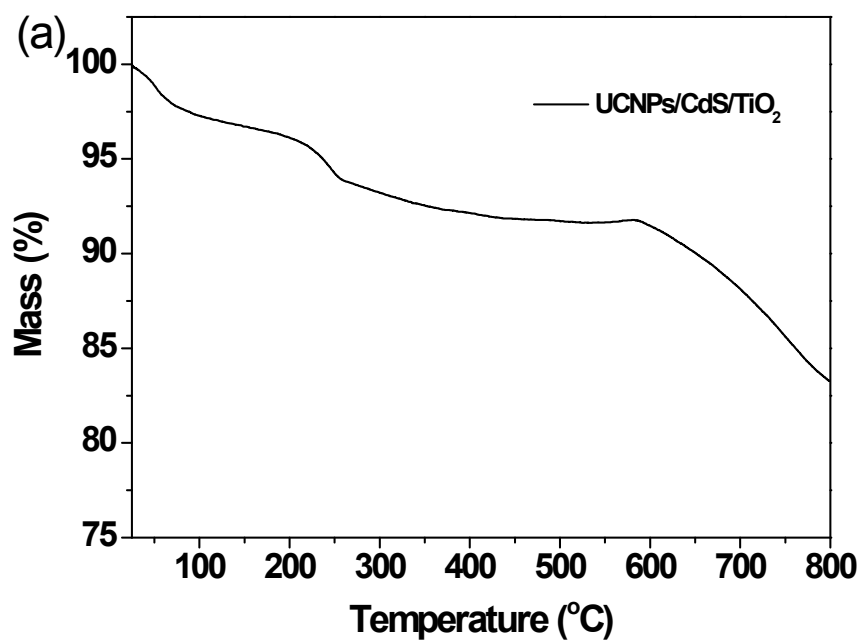


Fig. S4. Thermal gravity analysis (TGA) for the as-prepared UCNPs/TiO₂/CdS nanofibers (a), and PVP (b).

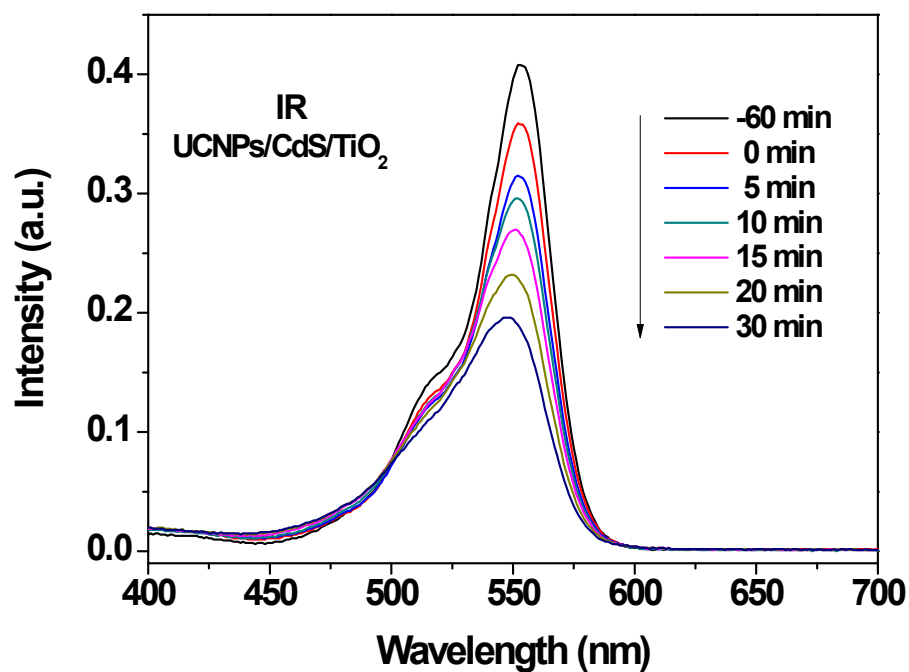


Fig. S5. UV-vis absorbance spectra of RhB solution showing the photodecomposition of the RhB dye in solution (2.5 mg/L) over in presence of the UCNPs/CdS/TiO₂ nanofibers (5 mg) obtained from 100 mM CdS and 200 mM UCNPs at different irradiation times under irradiation of a 1500 mW Xe lamp with an IR filter.

Table S1.Element composition of the as-prepared UCNPs/TiO₂/CdS nanofibers calculated from EDX analyses.

Element	Weight %	Atomic %
O	11.68	31.26
F	7.98	18.00
Na	1.40	2.61
S	2.84	3.79
Ti	29.56	26.42
Y	20.75	9.99
Cd	11.46	4.37
Tm	2.12	0.54
Yb	12.22	3.02
Totals	100	

Table S2 Element composition of the as-prepared UCNPs/PVP/CdS/TBT nanofibers calculated from EDX analyses.

Element	Weight %	Atomic %
C	14.83	34.96
O	12.67	22.43
F	9.86	14.70
Na	3.02	3.71
S	2.43	2.15
Ti	22.03	13.02
Y	15.80	5.03
Cd	9.20	2.32
Tm	1.79	0.30
Yb	8.38	1.37
Totals	100	