# Supporting Information

## Mesoporous semiconductor combined with up-conversion nanoparticles for enhanced photodynamic therapy under near infrared light

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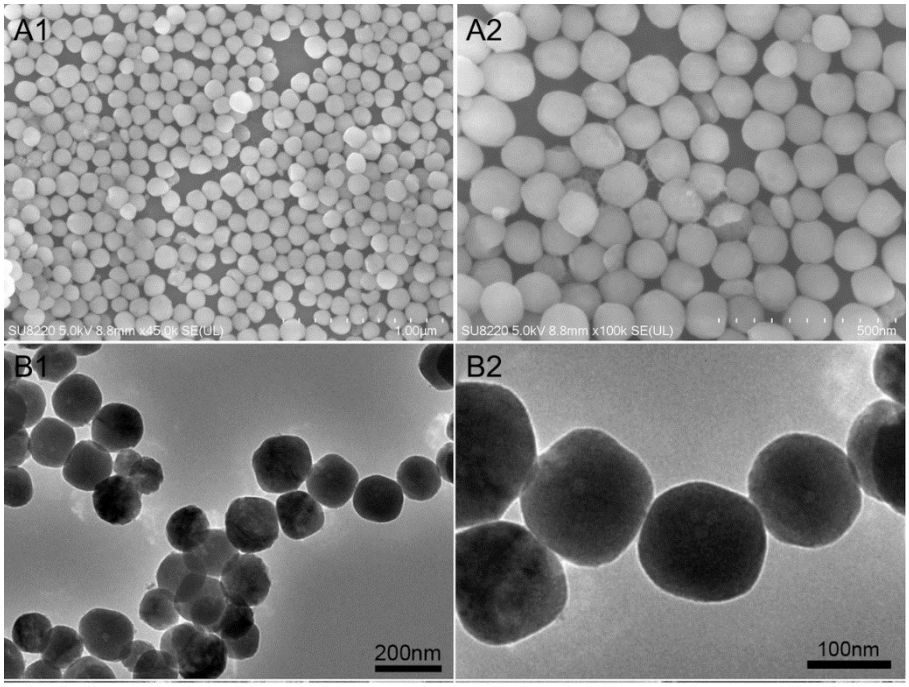



**Fig. S1** (A1-A2) SEM images and (B1-B2) TEM images of the $NaYF_4$:Yb,Tm precursor.

**Table S1.** The EDS results of NYF@Sn

**MThin Smart Quant Results (Theoretical)**

| Element | Weight % | Atomic % | Net Int. | Net Error% | KABFactor |
|---|---|---|---|---|---|
| F K | 17.95 | 52.34 | 47 | 1.31 | 1 |
| NaK | 5.56 | 13.40 | 26.5 | 2.01 | 0.55 |
| SnL | 2.51 | 1.17 | 2.2 | 36.16 | 2.97 |
| TmL | 11.65 | 3.82 | 7.1 | 2.65 | 4.32 |
| YbL | 31.57 | 10.11 | 18.8 | 4.50 | 4.4 |
| Y K | 30.76 | 19.16 | 24.7 | 3.81 | 3.26 |

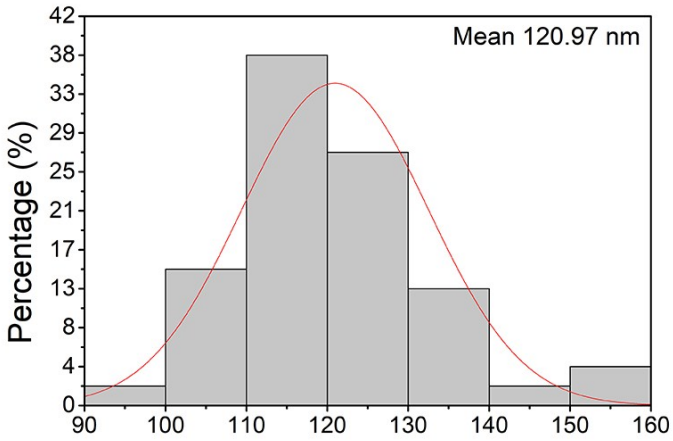



**Fig. S2** Particle size distribution of $NaYF_4$:Yb,Tm.

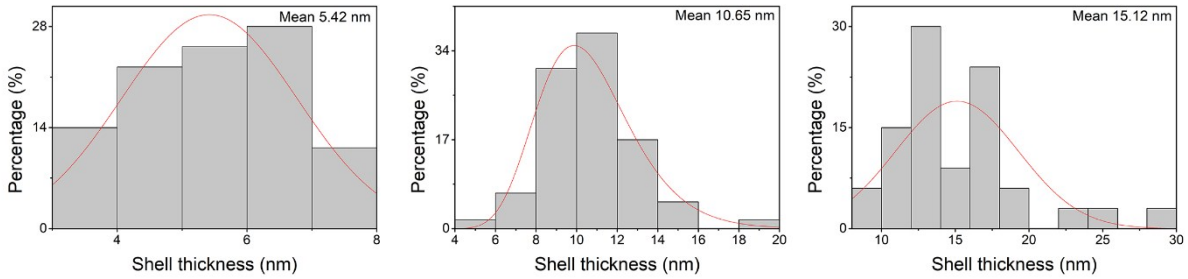



**Fig. S3** The average shell thicknesses of three NYF@Sn samples.

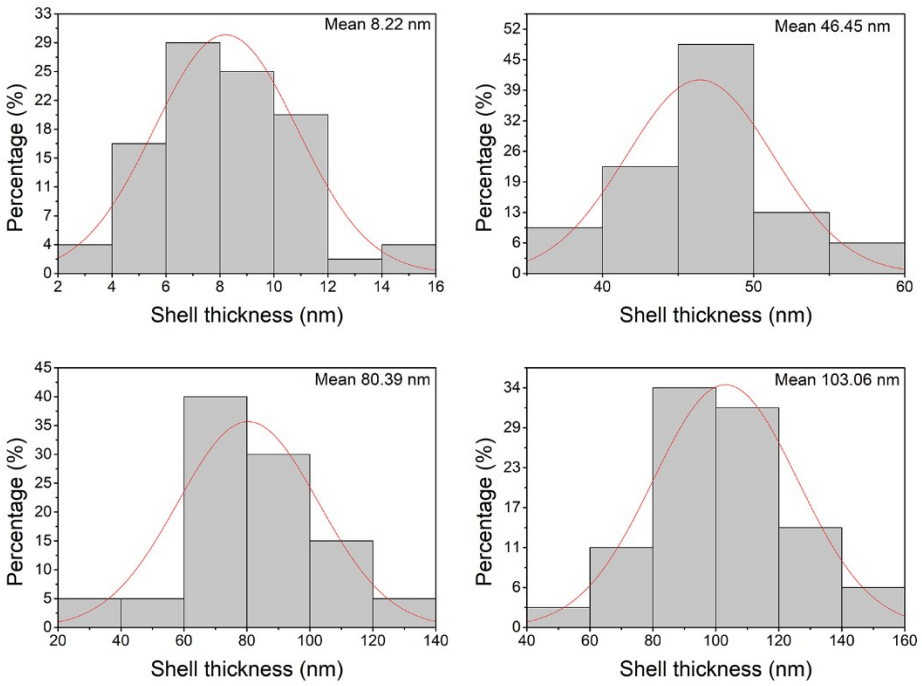



**Fig. S4** The average shell thicknesses of four NYF@Ti samples.

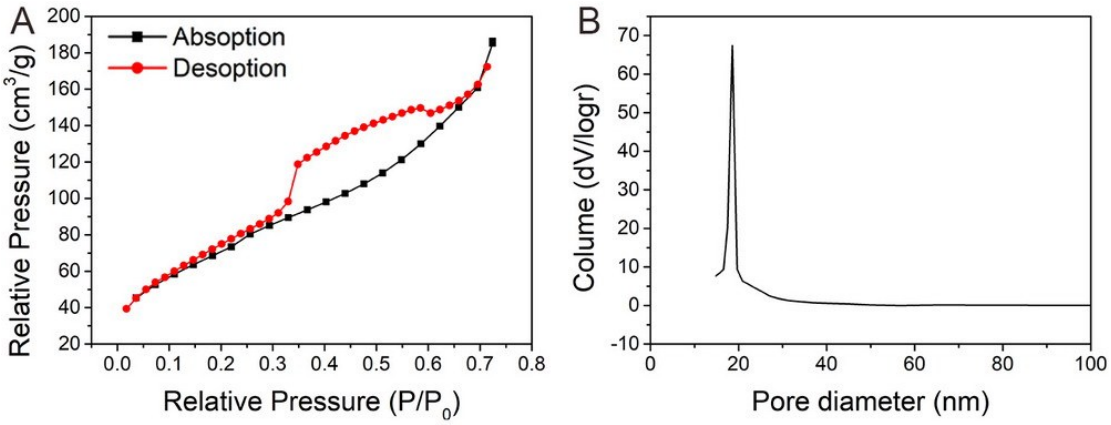
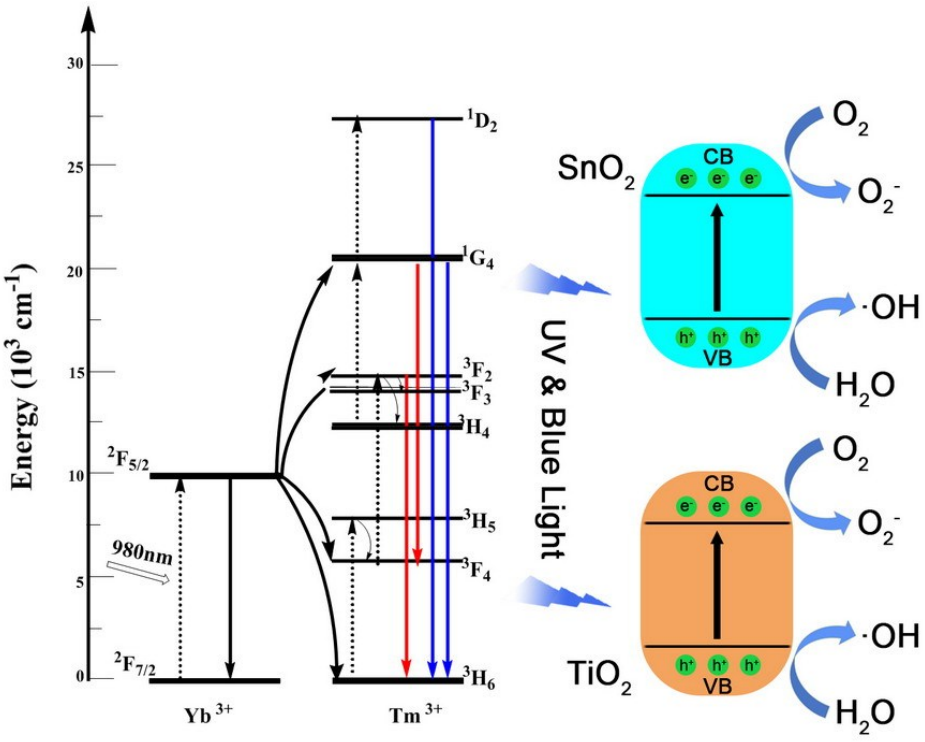



**Fig. S5** (A) $N_2$ adsorption/desorption isotherm and (B) the pore size distribution of NYF@Ti2 composite.




**Scheme S1.** The schematic diagram of NIR-induced ROS.