

Electronic Supplementary Information (ESI)

Table S1. Absorption peak and identified functional groups of β - In_2S_3 .

Wavenumbers (cm^{-1})	Identified
3426, 1624	O-H vibration
2956, 2922, 2851	C-H of CH_3, CH_2 stretching vibration
1576, 1524, 1410	C=C, C=N stretching vibration
1315, 1271, 1160	C-H of CH_3, CH_2 in-plane bending vibration
1016, 928	C-H of CH_3, CH_2 out-plane bending vibration
701, 619	C-H in-plane swing vibration and out-plane bending vibration
451	In-S stretching vibration coupled slightly with C- CH_3

Fig. S1. TEM images of products at different times (a) 0 h, and (b) 0.5 h.

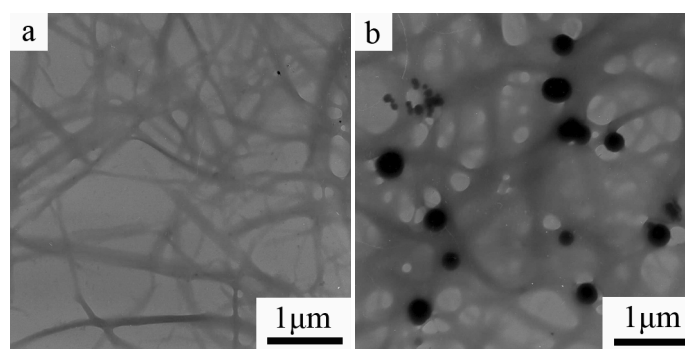


Table S2. EA data of the products at different times.

	C	H	N	S	O	In
0 h (EA%)	58.90	10.39	0.051	13.03	1.72	15.91
(mol ratio)	35.42	74.97	0.026	2.94	0.78	1
1 h (EA%)	8.248	1.845	3.960	11.69	23.84	50.42
(mol ratio)	1.565	4.200	0.644	0.832	3.39	1
3 h (EA%)	8.993	1.513	1.471	24.86	3.30	59.86
(mol ratio)	1.402	2.84	0.20	1.49	0.40	1
12h (EA%)	5.569	1.009	0.786	26.68	2.486	64.22
(mol ratio)	0.83	1.80	0.10	1.49	0.28	1
24h (EA%)	3.196	1.023	0.841	27.56	1.13	66.25
(mol ratio)	0.46	1.78	0.10	1.49	0.12	1

Fig. S2. TG curves of the samples prepared by solvothermal treatments for (a) 0 h, (b) 1 h, (c) 3 h, (d) 12 h, and (e) 24 h.

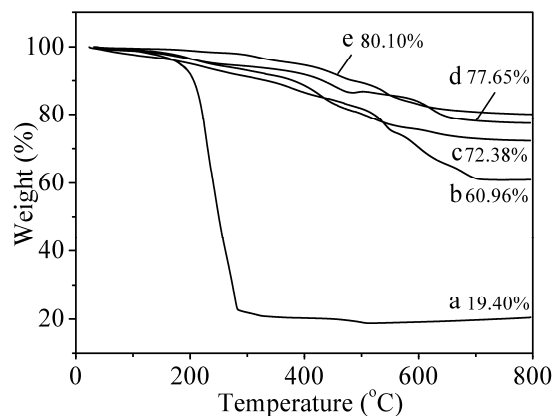


Fig. S3. SEM images of the product prepared by solvothermal treatment for 1.5 h.

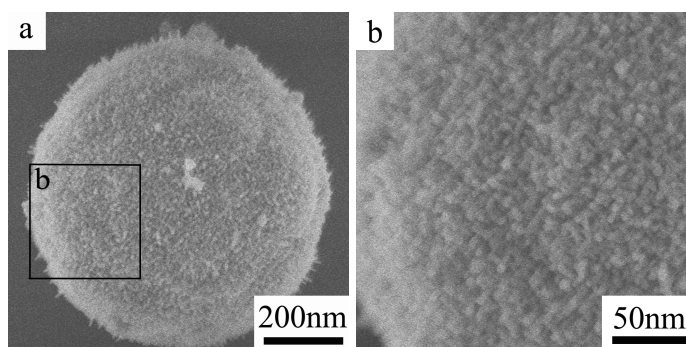


Fig. S4. TEM image and XRD pattern of the product obtained with molar ratio thiol to $\text{In}(\text{NO}_3)_3$ of 3:2.

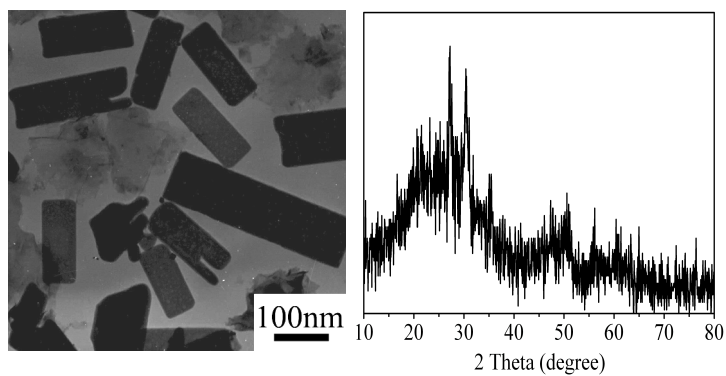


Fig. S5. TEM images of In_2S_3 obtained from different sulfur sources (a) Na_2S , and (b) thiourea; XRD patterns (c) and IR spectra (d) of In_2S_3 obtained from thiourea.

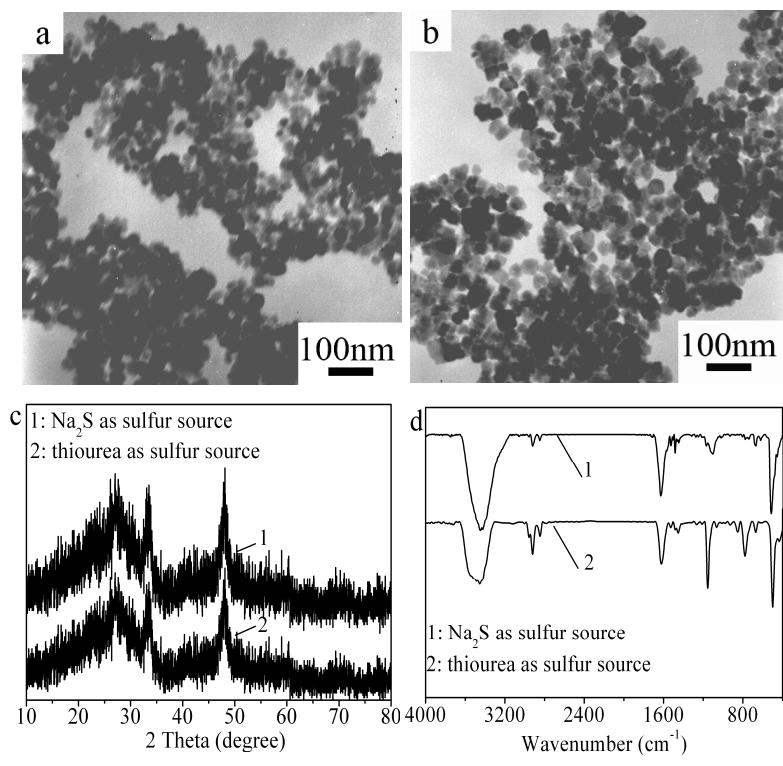


Fig. S6. Particle size distribution diagrams of In_2S_3 obtained from different sulfur sources (a) Na_2S , (b) thiourea.

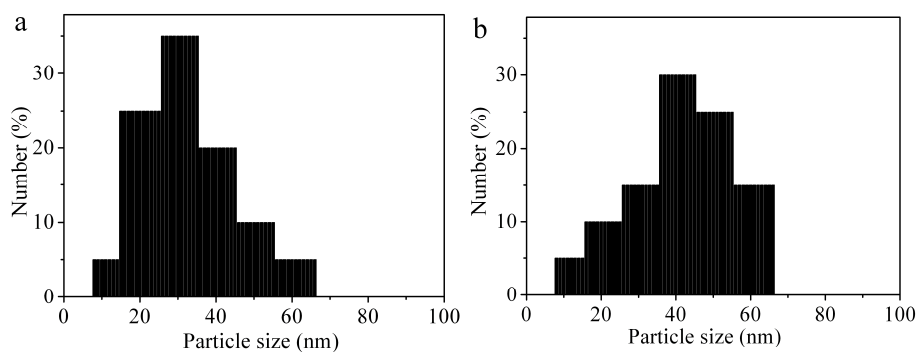


Fig. S7a. Absorption spectrum of the RhB solution in the presence of In_2S_3 nanotubes under exposure to sunlight (a) 0 min, (b) 30 min, (c) 60 min, (d) 90 min, (d) 120 min, (e) 180 min, and (f) 210 min; **Fig. S7b.** The photocatalytic efficiency as a function of recycling times.

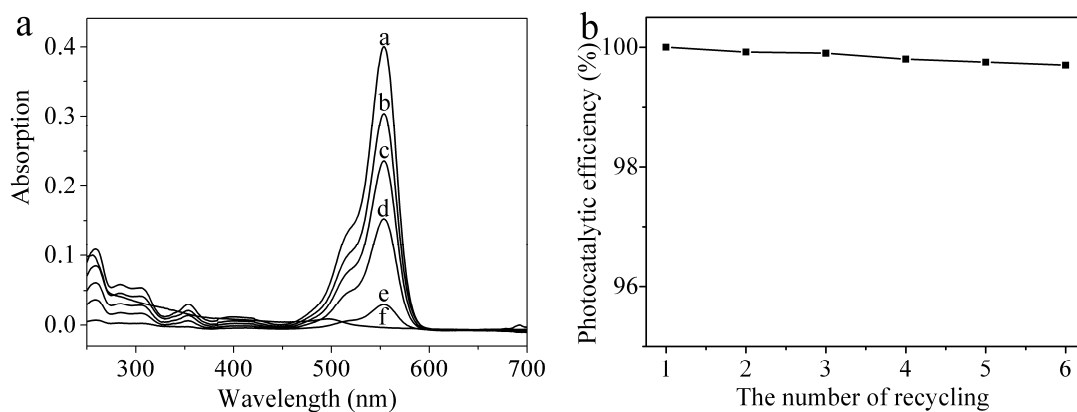


Fig. S8. UV-vis absorption spectrum (a) In_2S_3 nanoparticles, and (b) P25.

