

Supporting Information

Antimony Sulphoiodide (SbSI), a Narrow Band-Gap Non-Oxide Ternary Semiconductor with Efficient Photocatalytic Activity

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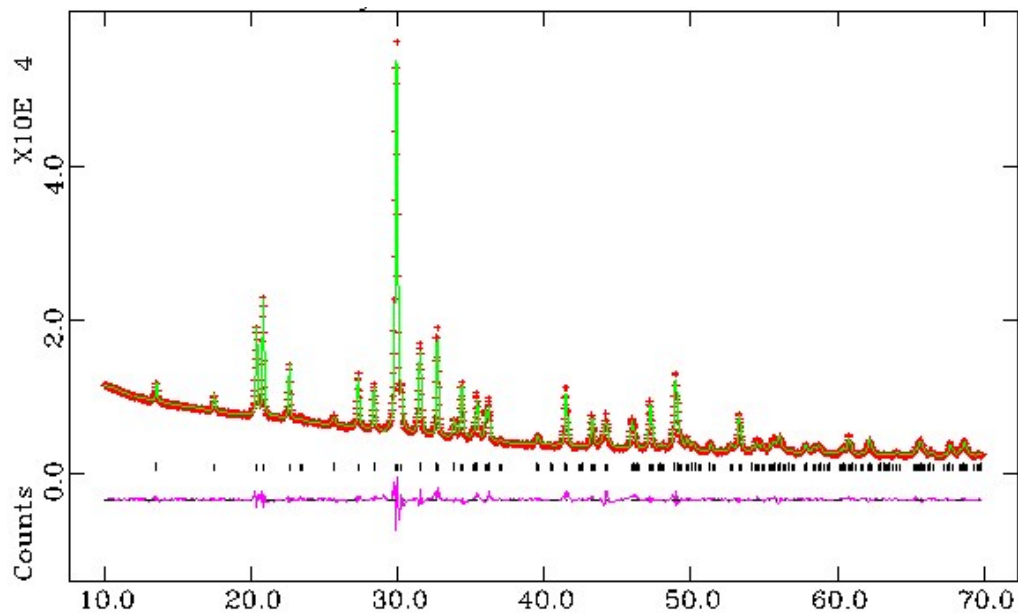


Figure S1. Rietveld refinement of SbSI.

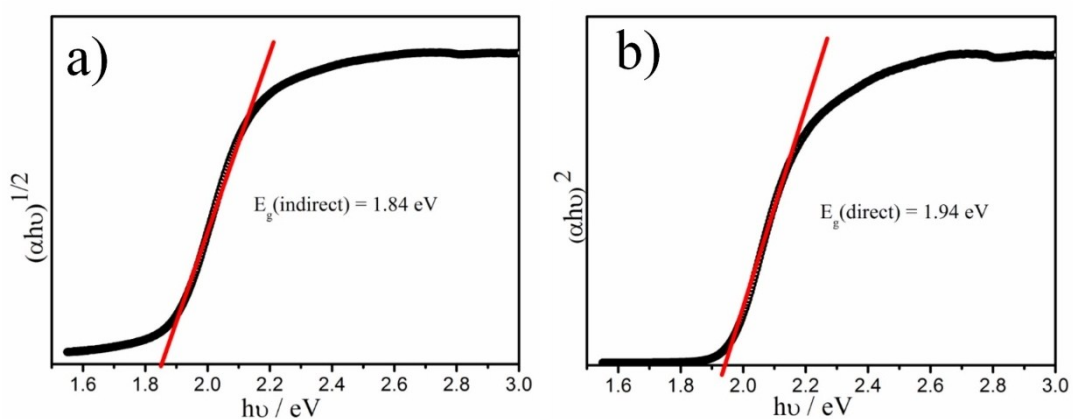


Figure S2. Shows the calculated indirect and direct band gap of SbSI respectively by using Tauc plot.

Table S1. Crystallographic parameters of SbSI from Rietveld refinement.

Formula	SbSI
Radiation	Cu K α
2 θ (degree)	10-70
Symmetry	Orthorhombic
Space group	<i>Pnam</i> (62)
a/ Å	8.5262
b/ Å	10.1391
c/ Å	4.0989
α /degree	90
β /degree	90
γ /degree	90
Volume / Å ³	354.348
Z	4
R _p	2.4
R _{wp}	3.6
χ^2	7.58

Table S2. Interplane d-spacing value of orthorhombic SbSI.

hkl value	d- spaing (Å)	Multiplicity	% of total facet area
(110)	6.52560420	4	65.06402817
(020)	5.06955000	2	7.56251648
(120)	4.35748401	4	
(200)	4.26312000	2	
(210)	3.92986994	4	
(011)	3.80016430	4	22.16256756
(111)	3.47101180	8	5.21088779
(130)	3.14187058	4	
(121)	2.98561532	8	
(201)	2.95473302	4	
(211)	2.83673198	8	

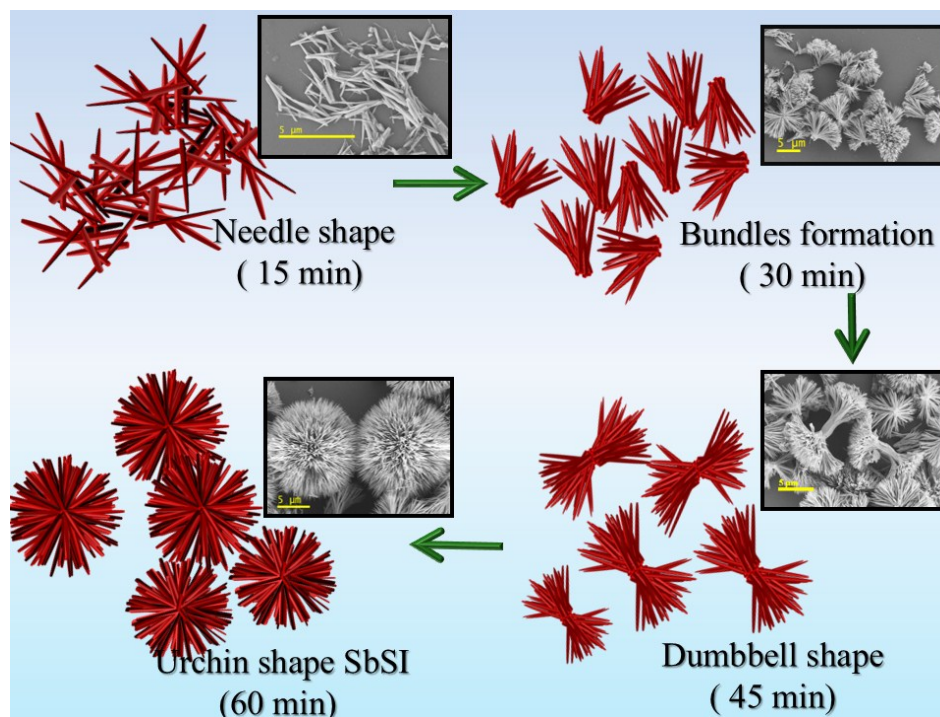


Figure S3. Schematic depiction and FESEM images of the stepwise transition from SbSI needles/rods to urchins: (aliquots collected from the reaction mixture at 110 °C at regular time intervals).

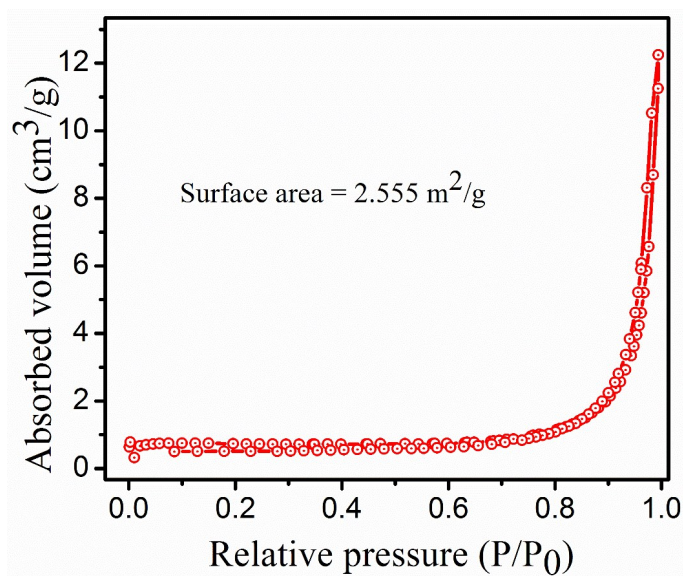


Figure S4. Nitrogen adsorption and desorption isotherms of SbSI

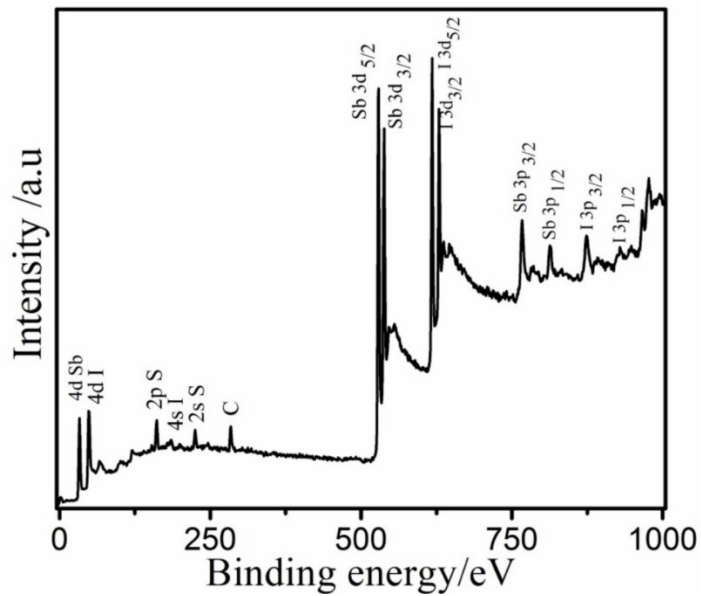


Figure S5. XPS spectrum of SbSI in the range of (0-1400) ev.

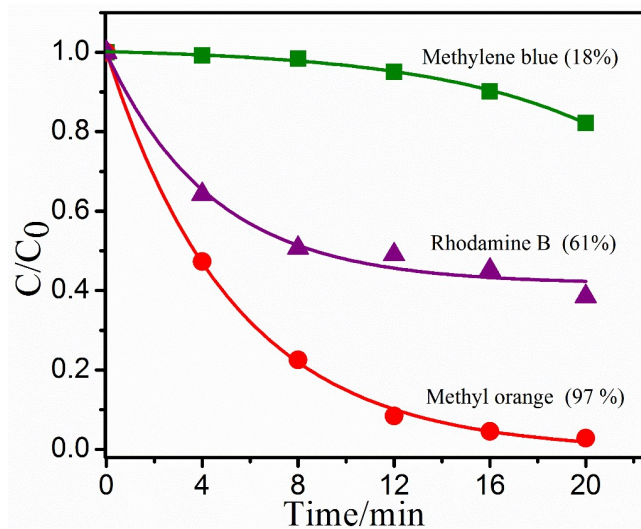


Figure S6. Fitted photodegradation profiles of Methylene blue, Rhodamine B and Methyl orange at 20 minutes under simulated solar irradiance.

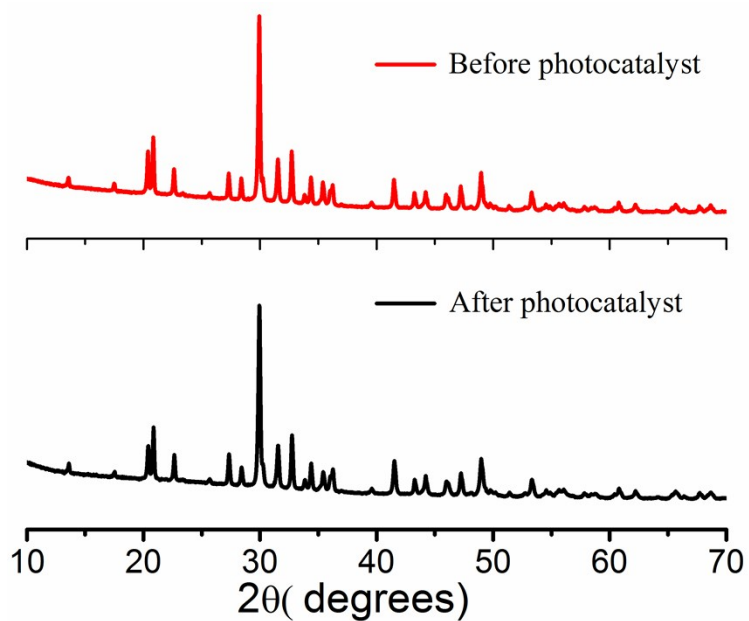


Figure S7. PXR D of SbSI before and after photocatalyst experiments.

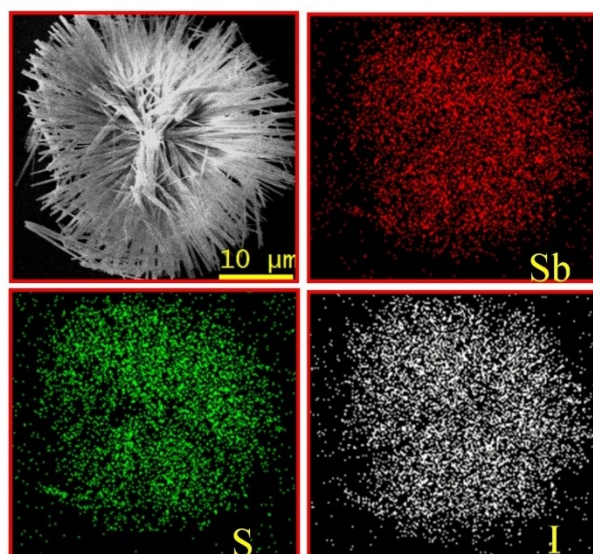


Figure S8. The recorded FESEM image of single urchin shape SbSI, and the corresponding elemental mapping of Sb (red), Sulphur (green), Iodine (White) at the end photocatalyst experiments