

## Ag<sub>2</sub>S quantum dot in-situ coupling to hexagonal SnS<sub>2</sub> with enhanced photocatalytic activity for MO and Cr (VI) removal

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samples	Ag <sup>+</sup> (mg/L)	Sn <sup>4+</sup> (mg/L)
0.5% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.102	32.132
1% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.304	31.953
3% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.924	31.521
5% Ag <sub>2</sub> S/SnS <sub>2</sub>	1.525	30.769

Table. S1 The measured concentration of Ag<sup>+</sup> and Sn<sup>4+</sup>

samples	Ag <sup>+</sup> (mmol)	Sn <sup>4+</sup> (mmol)	S <sup>2-</sup> (mmol)	Molar ratio		
				Ag <sup>+</sup>	Sn <sup>4+</sup>	S <sup>2-</sup>
0.5% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.00188	0.54258	1.094	0.115%	33.115%	66.77%
1% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.00560	0.54084	1.094	0.341%	32.969%	66.689%
3% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.01737	0.53850	1.094	1.053%	32.639%	66.308%
5% Ag <sub>2</sub> S/SnS <sub>2</sub>	0.02898	0.53028	1.094	1.753%	32.075%	66.172%

Table. S2 The content and molar ration of the elements for all samples.

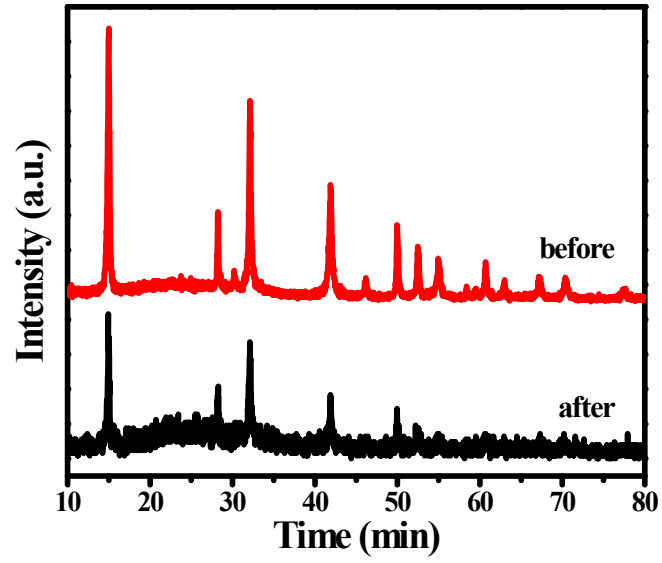


Fig. S1 XRD patterns of 1%  $\text{Ag}_2\text{S}/\text{SnS}_2$  composite before and after the cycling photocatalytic experiments.

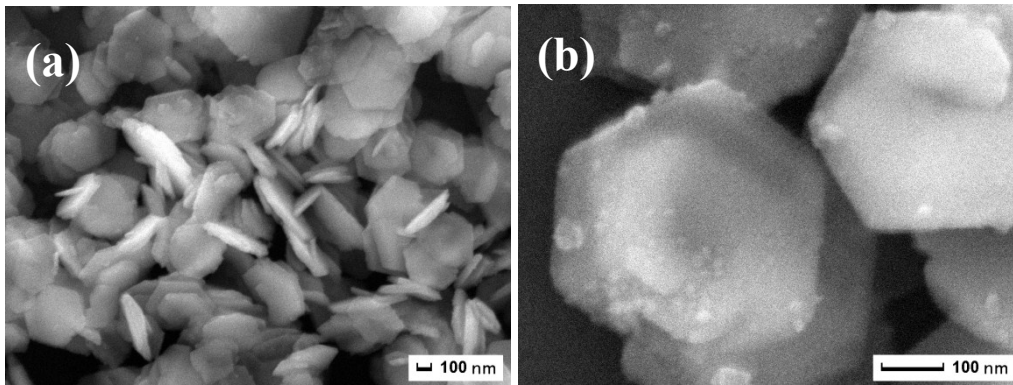


Fig. S2 SEM images of 1%  $\text{Ag}_2\text{S}/\text{SnS}_2$  composite after the cycling photocatalytic experiments.