

## Electronic Supplementary Information

### Piezotronic Effect Enhanced Photocatalyst of Ag<sub>2</sub>S/ZnO for Degradation of Organic Dyes

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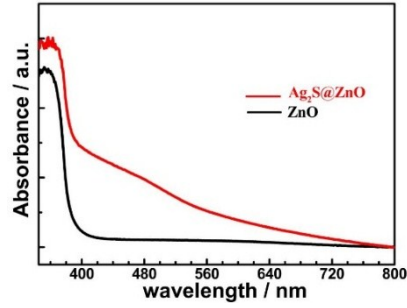


Fig. S1 Absorption spectra of ZnO and Ag<sub>2</sub>S@ZnO NW film.

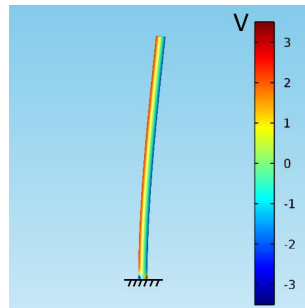


Fig. S2 The piezopotential distribution of mechanically bended ZnO NW.

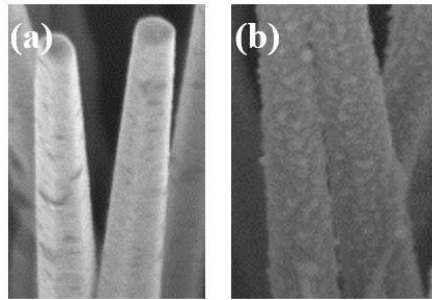


Fig. S3 SEM images of (a) ZnO NW and (b) Ag<sub>2</sub>S@ZnO NWs after photocatalytic activity.

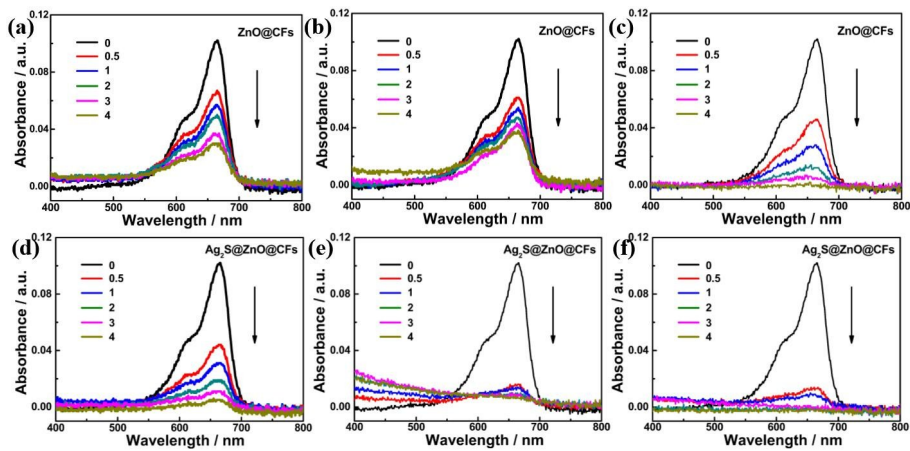
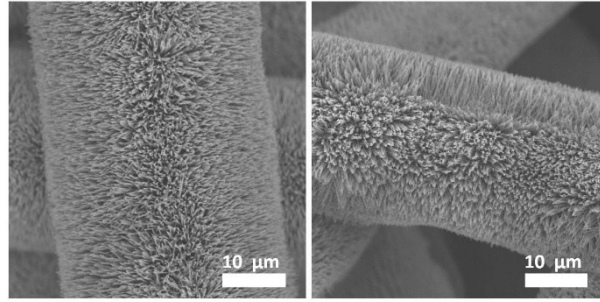
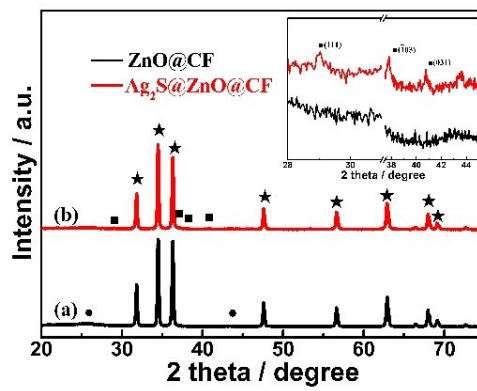


Fig. S4 UV-vis spectra of MB solution which catalyzed by (a-c) ZnO and (d-f) Ag<sub>2</sub>S@ZnO NWs under illumination, sonication, and illumination/sonication conditions.



**Fig. S5** SEM images of (a) ZnO NW and (b) Ag<sub>2</sub>S@ZnO NWs on carbon fibers after dye degradations.



**Fig. S6** XRD spectra of (a) ZnO and (b) Ag<sub>2</sub>S@ZnO NWs after eight cycle of photocatalytic activity with applying sonication.

sample	Morphology	Synthetic method	Illumination condition	Dye	Degradation rate (C/C <sub>0</sub> )	Ref
Ag <sub>2</sub> S@ZnO	nanowires	hydrothermal	simulated solar light	MB	~7.8 % (60 min)	This work
ZnSnO <sub>3</sub>	nanowires	hydrothermal	UV	MB	~58 % (60 min)	<sup>1</sup>
ZnO	nanoflowers	hydrothermal	UV	MO	~50 % (60 min)	<sup>2</sup>
Ag <sub>2</sub> O/ZnO	nanoflowers	chemical coprecipitation	UV	MO	~20 % (60 min)	<sup>2</sup>
N-, S-, and C-doped ZnO	nanoparticles	precipitation	UV	AO7	~60 % (60 min)	<sup>3</sup>
ZnO/CuO (50%/50%)	nanocomposite	thermal decomposition	visible light	MB MO	~17.1 % ~19.3 % (60 min)	<sup>4</sup>
ZnO	microscale	calcination	UV+vis	CV	~10 % (80 min)	<sup>5</sup>
ZnO/TiO <sub>2</sub> (0.02-0.05%)	microscale	calcination	UV+vis	CV	~30 % (80 min)	<sup>5</sup>
TiO <sub>2</sub> P25	microparticle	commercial	UV+vis	CV	~40 % (80 min)	<sup>5</sup>
Ni <sub>45</sub> Co <sub>37</sub> @Pt <sub>18</sub> /ZnO	nanocomposite	element lithographic	UV UV+vis	MB	~10 % ~20 % (60 min)	<sup>6</sup>
Pt/ZnO	nanocomposite	element lithographic	UV+vis	MB	~50 % (60 min)	<sup>6</sup>
La/TiO <sub>2</sub> -La/ZnO-B-RGO	nanocomposite	sol-gel	visible light	MB	~44 % (60 min)	<sup>7</sup>
NiO-Fe <sub>2</sub> O <sub>3</sub> -ZnO	nanocomposite	ion-exchange	simulated solar light	MO	~48 % (60 min)	<sup>8</sup>
C-doped ZnO	nanoparticles	thermal decomposition	visible light	RhB	~55 % (60 min)	<sup>9</sup>
ZnO@TiO <sub>2</sub> /graphene	nanocomposite	-	simulated solar light	MB RhB	~55 % ~78 % (60 min)	<sup>10</sup>

**Table S1** Photocatalytic performance of ZnO-based materials. MB= methylene blue; MO= methyl orange; AO7= acid orange 7; CV= crystal violet

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