Supporting Information

Efficient Piezocatalytic Hydrogen Peroxide Production over CdS/ZnS Heterostructured Nanorods via Ultrasonic Cavitation in Pure Water

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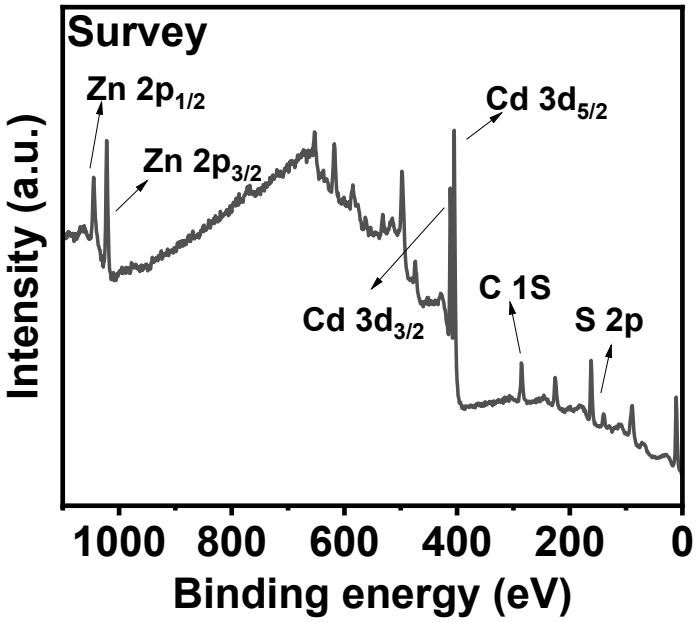

Fig. S1. XPS survey spectrum of CdS/ZnS-1.

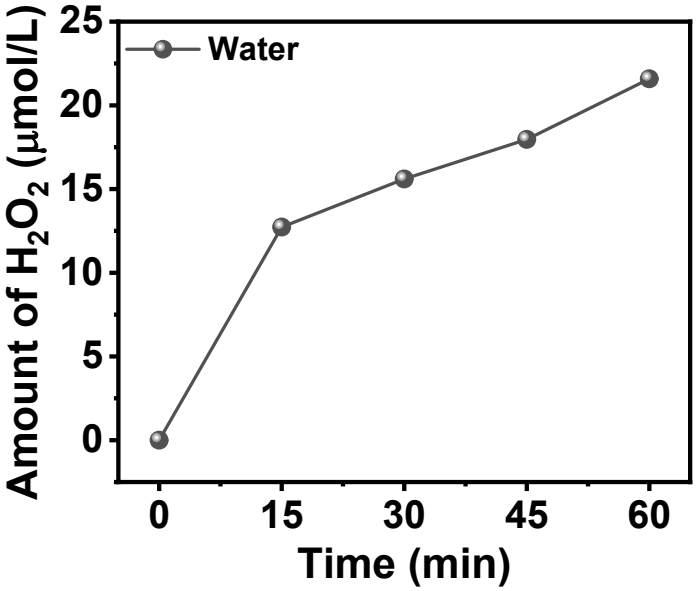

Fig. S2. H_2O_2 evolution in pure water without catalysts.

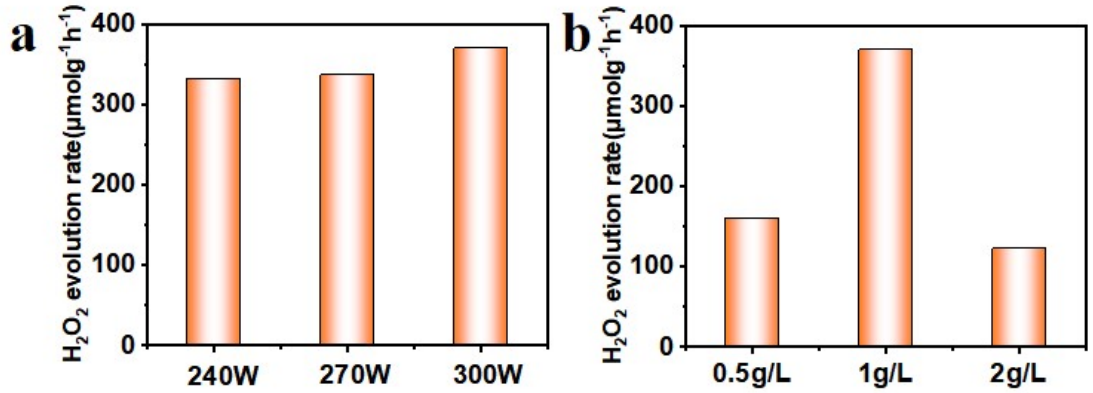

Fig. S3. (a) Comparison of H_2O_2 production under different ultrasonic power levels; (b) Comparison of H_2O_2 production under different catalyst loading conditions.

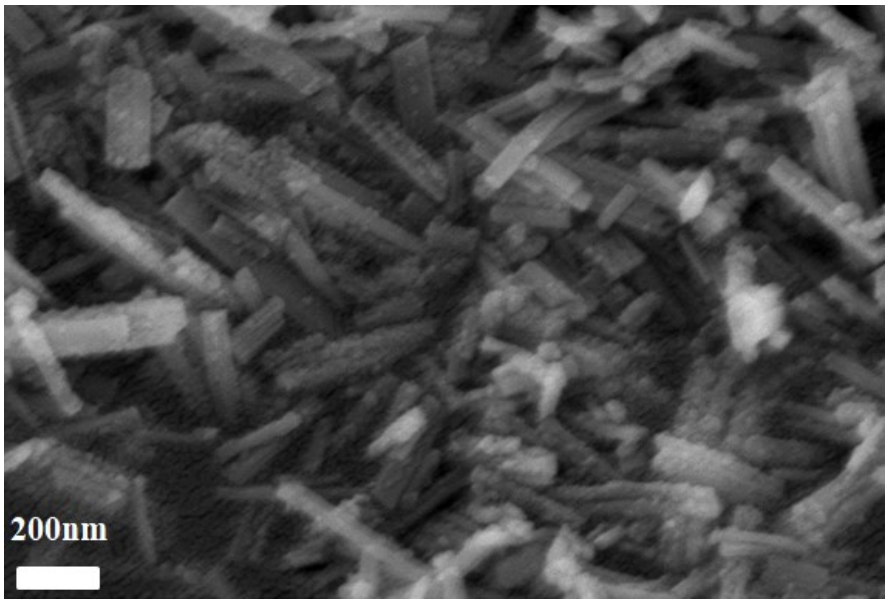

Fig. S4. SEM image of CdS/ZnS-1 after five cycles.

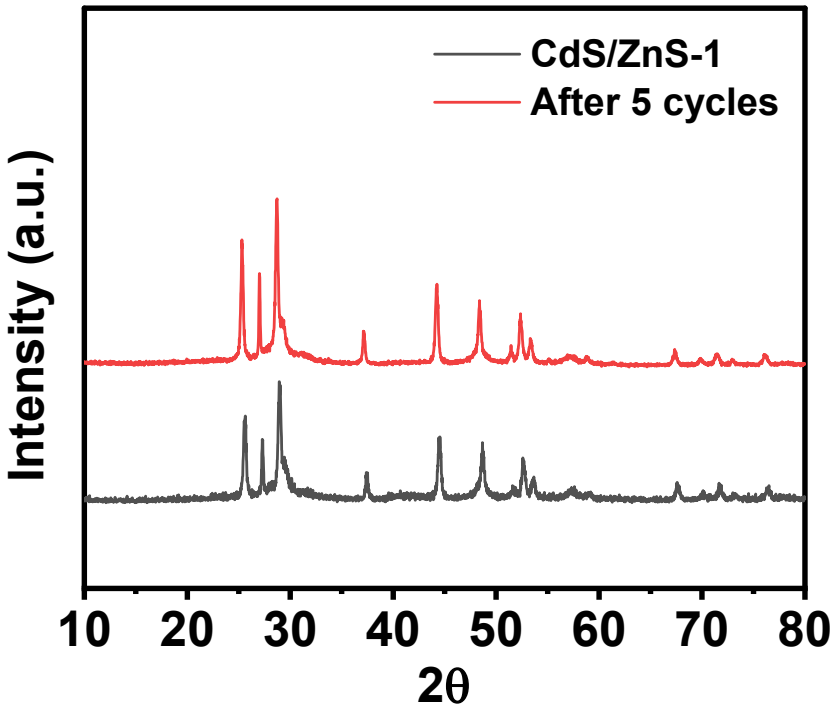

Fig. S5. XRD patterns of CdS/ZnS-1 before and after five cycles.

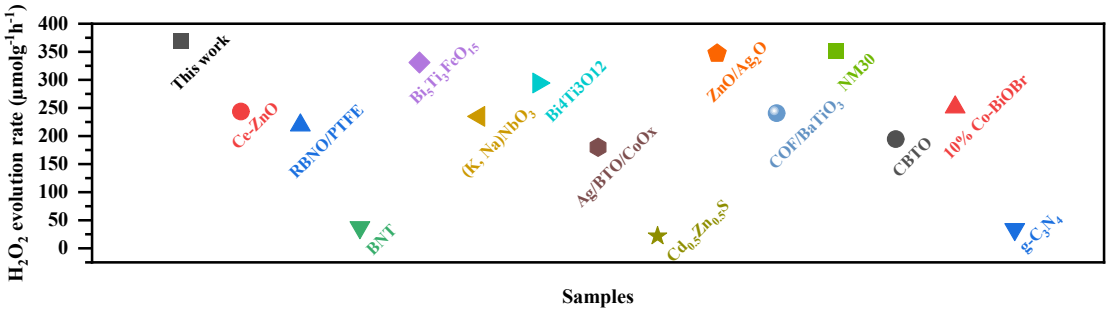

Fig. S6. Comparison of H_2O_2 production performance over CdS/ZnS-1 catalysts with previously reported.

Table S1. Catalytic application for H_2O_2 production driven by Ultrasonic vibration and corresponding experimental parameters.

NO.	Sample	Sample Dosage	Energy Source	H_2O_2 evolution rates (μmol g^{-1} h^{-1})	Refererence
1	CdS/ZnS-1	50 mg cat 50 mL H_2O	45 kHz，180 W	369.3	This work
2	Ce-ZnO	50 mg cat 100 mL H_2O	ultrasonic wave,6 h	243.67	1
3	RBNO/PTFE	20 mg cat 30 mL H_2O	68 kHz, 240 W	219.23	2
4	BNT	50 mg cat 100 mL H_2O	53 kHz, 150 W	37.3	3
5	$Bi_5Ti_3FeO_{15}$	50 mg cat 50 mL H_2O	40 kHz,120 W	331	4
6	(K, Na)NbO_3	200 mg cat 50 mL H_2O	40 kHz, 180 W	235	5
7	$Bi_4Ti_3O_{12}$	50 mg cat 100 mL H_2O	40 kHz,100 W	294.4	5
8	Ag/BTO/CoOx	30 mg cat 30 mL H_2O	40 kHz, 50 W	180	5
9	$Cd_{0.5}Zn_{0.5}S$	50 mg cat 100 mL H_2O	40 kHz, 120 W	21.9	6
10	ZnO/Ag_2O	100 mg cat 10 vol% MeOH	40 kHz, 400 W	346.9	7
11	COF/$BaTiO_3$	50 mg cat 100 mL H_2O	40 kHz, 300 W	240.7	8
12	NM30	5 mg cat 5 mL H_2O	53 kHz, 100 W	351.1	9
13	CBTO	50 mg cat 100 mL H_2O	40 kHz, 300 W	194.54	10
14	10% Co-BiOBr	25 mg cat 5 vol% EtOH	40 kHz, 200 W	251.3	11
15	g-C_3N_4	50 mg cat 100 mL H_2O	53 kHz, 150 W	34	12

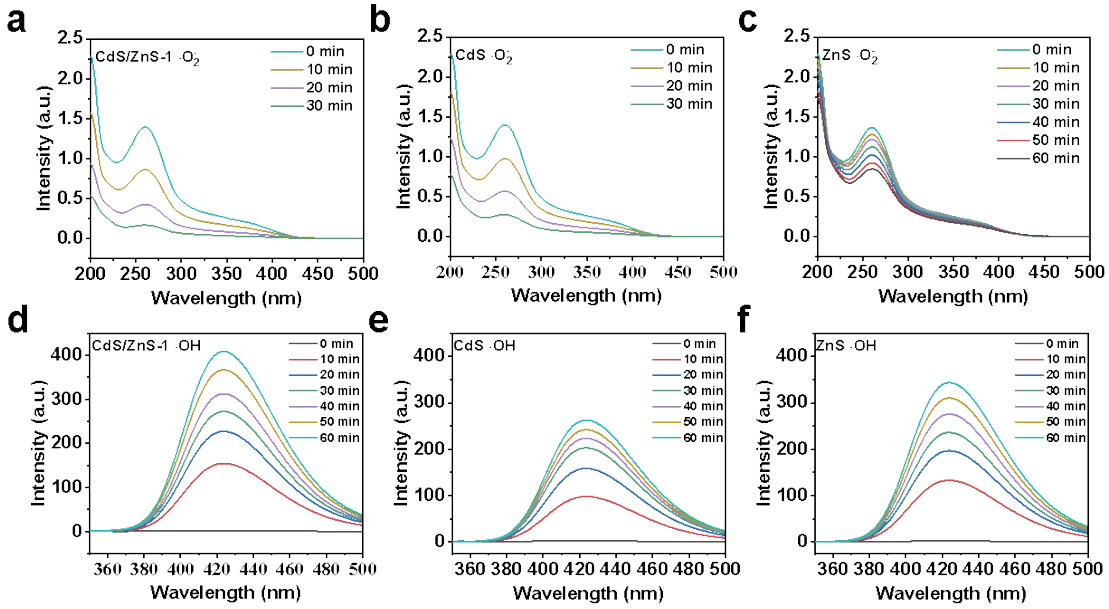

Fig. S7. Time-resolved profiles of superoxide anion radical ($O_2 \cdot^-$) generation from (a) CdS/ZnS-1, (b)CdS, and (c)ZnS under ultrasonic irradiation; Time-resolved profiles of hydroxyl radical (·OH) generation from (d) CdS/ZnS-1, (e)CdS, and (f)ZnS under ultrasonic irradiation.

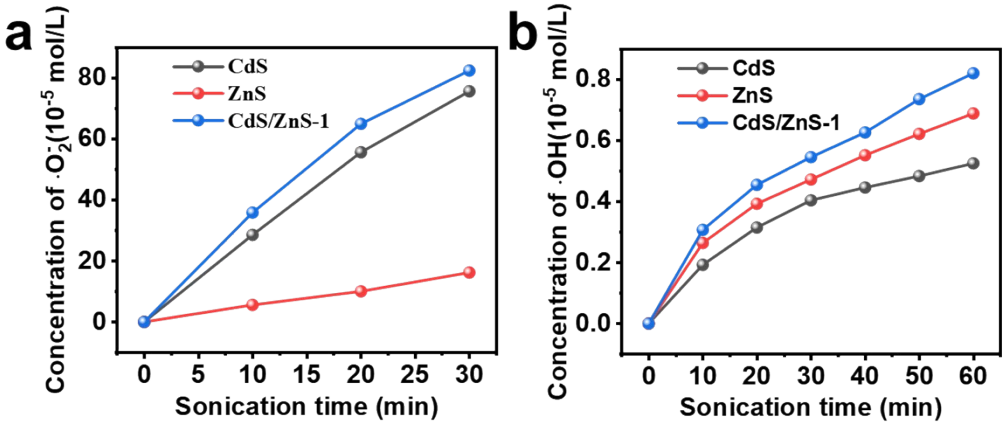

Fig. S8. (a)Concentration profiles of superoxide anion radical ($O_2 \cdot^-$) generated under ultrasonic irradiation; (b) Concentration profiles of hydroxyl radicals (·OH) generated under ultrasonic irradiation.

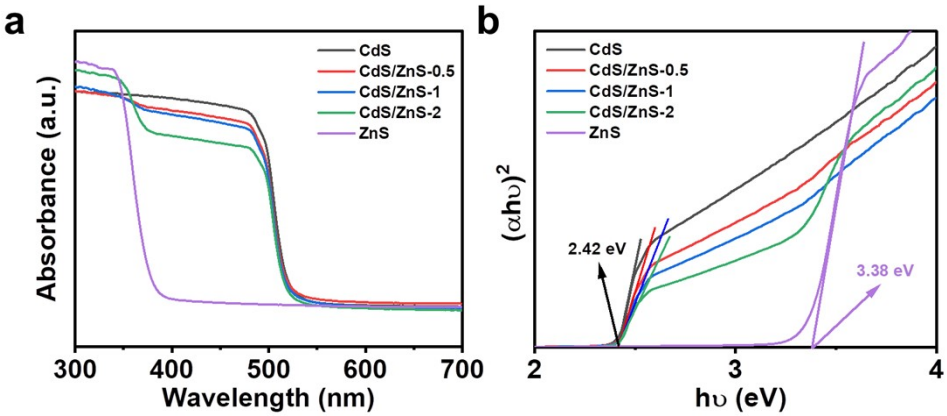

Fig. S9. (a) UV-Vis absorption spectra of CdS, CdS/ZnS-0.5, CdS/ZnS-1, CdS/ZnS-2, and ZnS. (b) Corresponding Tauc plots for determining the optical band gaps, where the band gaps of CdS (2.42 eV) and ZnS (3.38 eV) are indicated.

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