Supporting information†

Design of One-dimensional Cadmium Sulfide/Polydopamine Hetero-nanotube Photocatalysts for Ultrafast Degradation of Antibiotics

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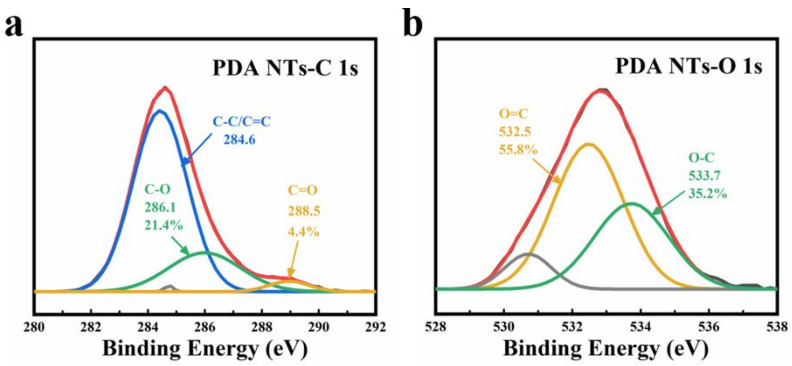


Figure S1. The XPS high-resolution spectra of (a) C1s and (b) O1s in PDA NTs.

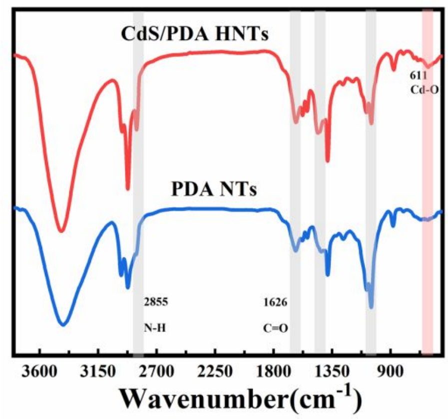


Figure S2. The FT-IR curves of CdS/PDA HNTs and PDA NTs.

P/Po	Volume [cc/g] STP	1/(W((Po/P)-1))
3.1387e-02	0.0241	1.075E+03
3.6486e-02	0.0252	1.204E+03
4.1460e-02	0.0254	1.362E+03

Area = 1.214E-01 m?g

Slope = 2.852E+04

Y - Intercept = 1.741E+02

Correlation Coefficient = 0.997931

C = 1.648E+02

Figure S3. BET results of CdS.

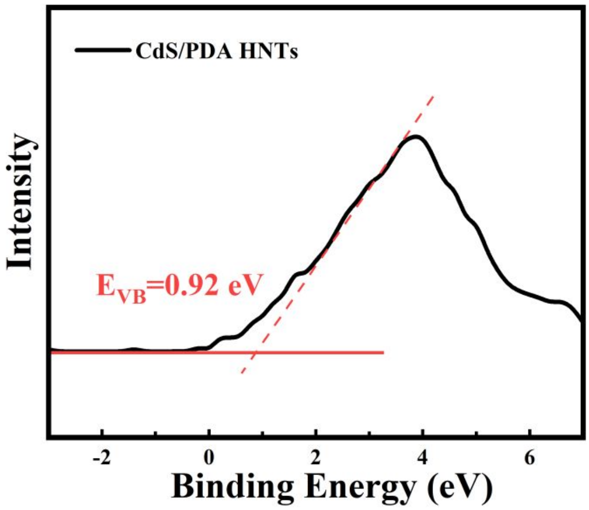


Figure S4. XPS valence band spectra of CdS/PDA HNTs nanostructure.

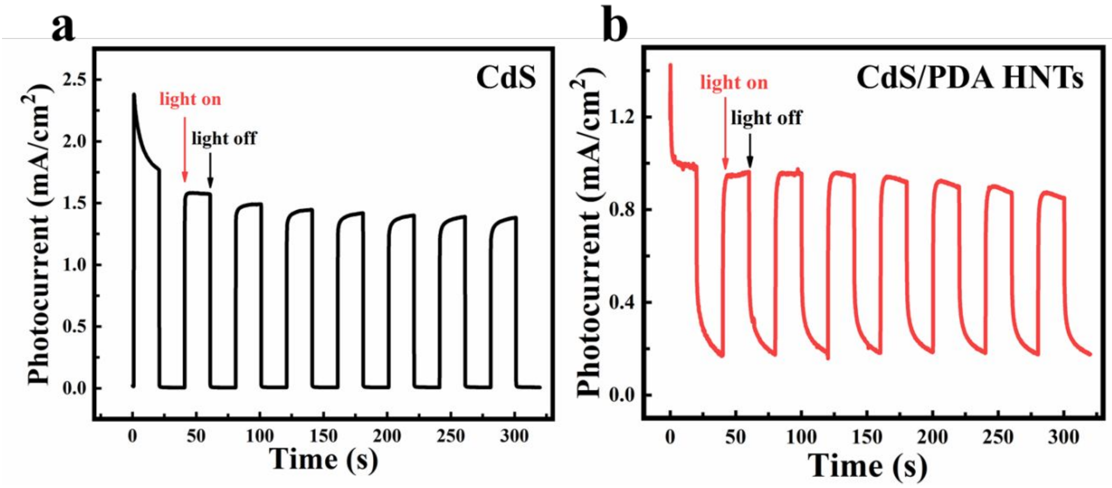


Figure S5. Photocurrent-time curves of (a) CdS and (b) CdS/PDA HNTs.

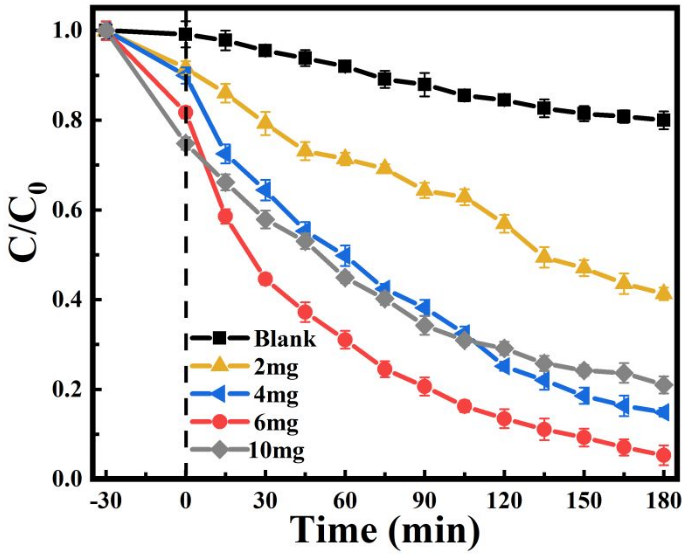


Figure S6. The catalytic degradation of TC with 0,2,4,6, and10 mg of CdS/PDA HNTs.

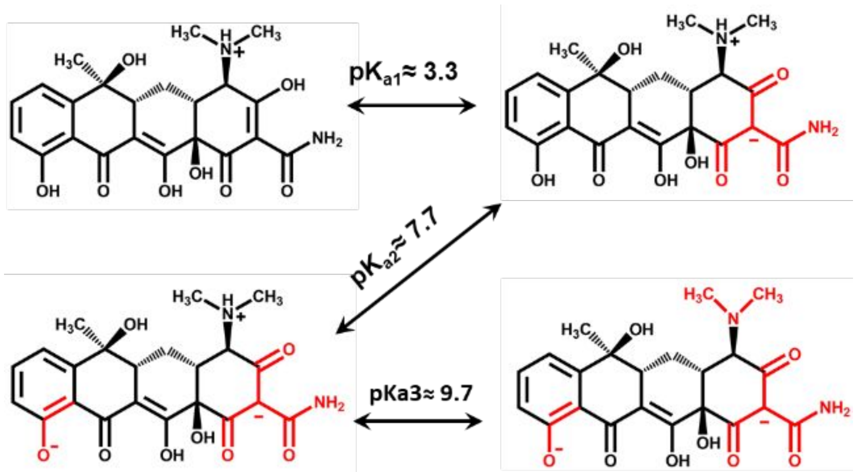


Figure S7. The molecular structure of TC under different pH.

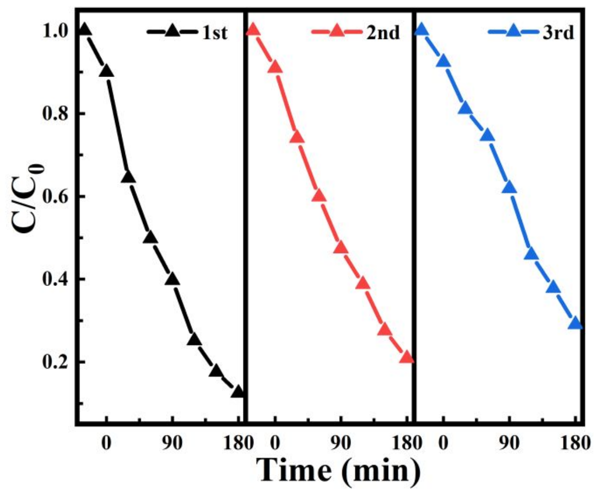


Figure S8. Reusability of CdS/PDA HNTs for catalytic degradation of TC.

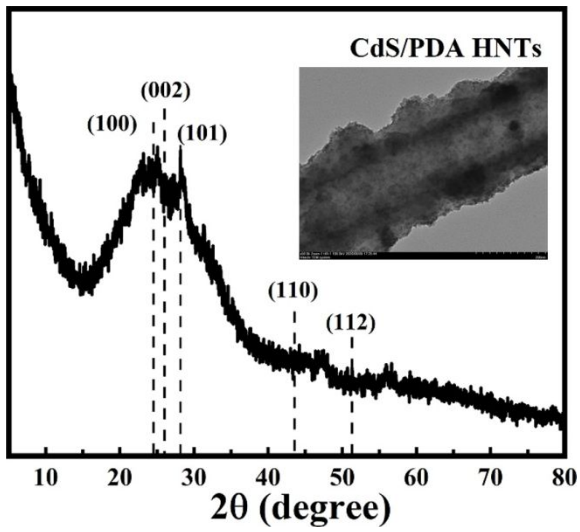


Figure S9. XRD patterns and TEM image of the CdS/PDA HNTs after three-time reactions.

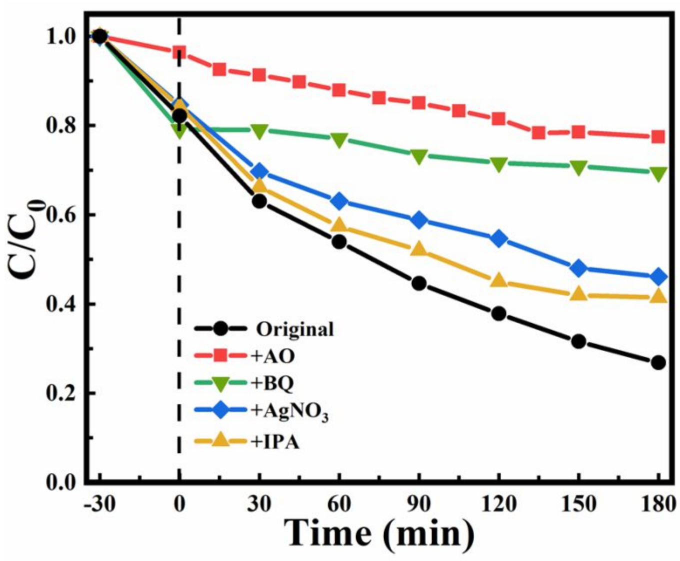
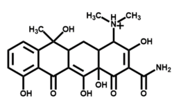
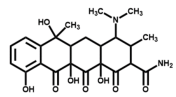
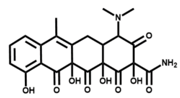
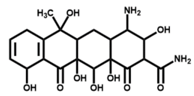
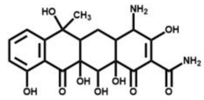
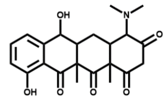
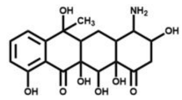
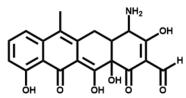
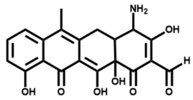
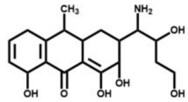
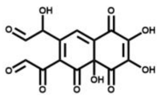
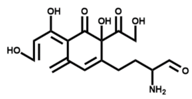
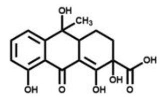
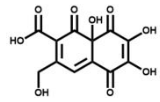
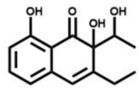
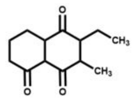
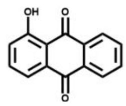
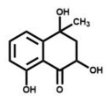
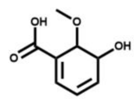
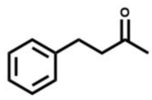
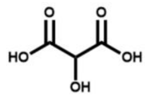


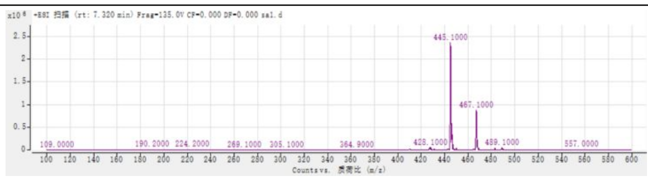
Figure S10. Photodegradation of TC by CdS/PDA HNTs with IPA, AO, BQ, and $AgNO_3$ as active species scavengers. The four specific trapping agents (AgNO3, IPA, BQ, and AO) contribute directional inactivate electrons (e−), •OH, $•O_2^{-}$ and active holes (h^+), respectively.

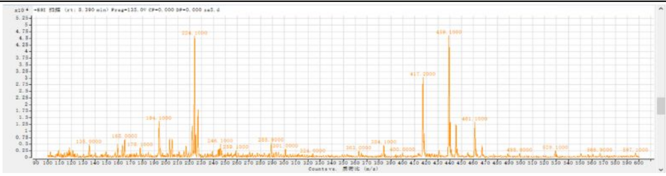
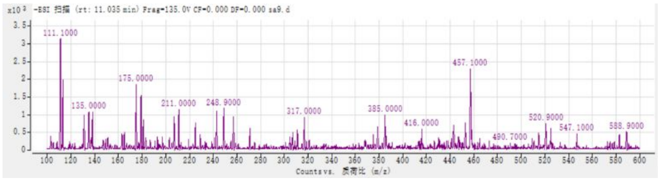
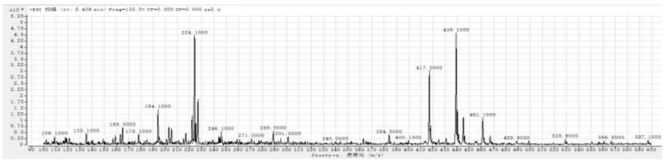
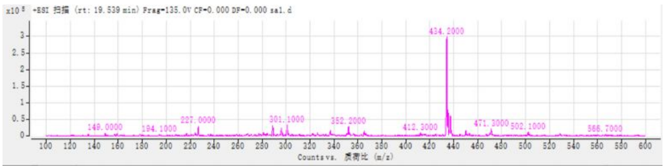
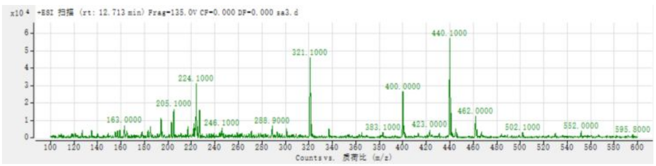
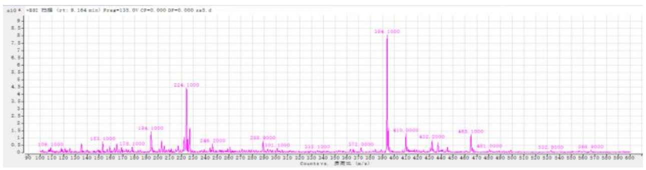
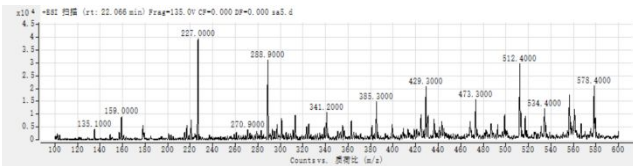
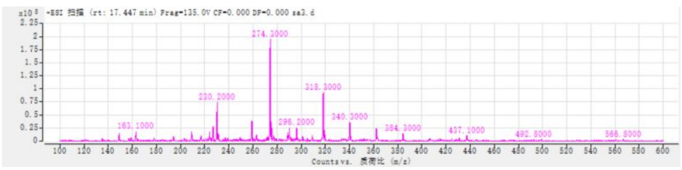
Table S1. The mass-to-charge ratio (m/z) and retention time of the TC degradation intermediates obtained through HPLC-MS, and the purposed chemical structures.

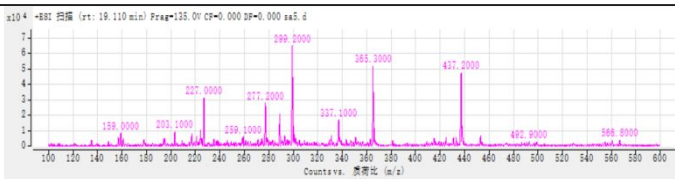
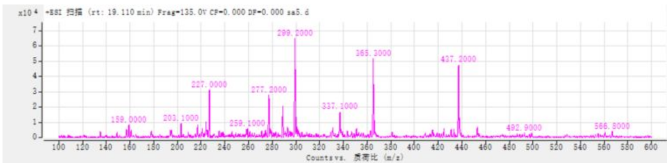
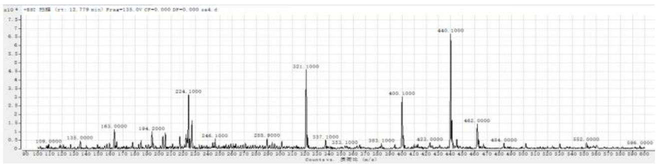
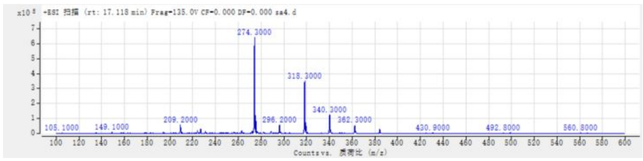
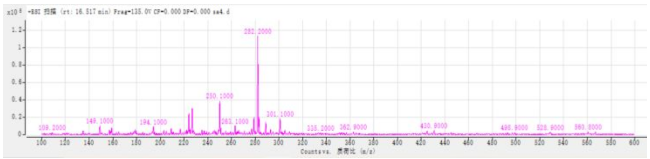
Number	Retention Time/min	m/z	Support Structure
TC	7.320	445	

1	8.390	461	
2	11.035	457	
3	8.439	439	
4	19.539	434	
5	12.713	400	
6	9.164	394	
7	22.066	385	
8	17.447	384	
9	19.110	365	
10	19.110	337	
11	19.110	337	

12	12.779	321	
13	17.118	296	
14	16.507	250	
15	1.161	224	
16	1.202	224	
17	15.767	209	
18	1.334	171	
19	20.181	149	
20	2.042	121	

Original MS spectra of TC degradation intermediates.	
TC	

1	
2	x10 3 -ESI 扫描 (rt: 11.035 min) Frag=135.0V CF=0.000 DF=0.000 sa9.d 111.1000 175.0000 135.0000 211.0000 248.9000 317.0000 385.0000 416.0000 457.1000 490.7000 520.9000 547.1000 588.9000 Counts vs. 质荷比 (m/z)
3	
4	x10 5 -ESI 扫描 (rt: 19.539 min) Frag=135.0V CF=0.000 DF=0.000 sa1.d 434.2000 149.0000 194.1000 227.0000 301.1000 352.2000 412.3000 471.3000 502.1000 566.7000 Counts vs. 质荷比 (m/z)
5	x10 4 -ESI 扫描 (rt: 12.713 min) Frag=135.0V CF=0.000 DF=0.000 sa3.d 440.1000 321.1000 224.1000 205.1000 400.0000 163.0000 246.1000 288.9000 383.1000 423.0000 462.0000 502.1000 552.0000 595.8000 Counts vs. 质荷比 (m/z)
6	
7	x10 4 -ESI 扫描 (rt: 22.066 min) Frag=135.0V CF=0.000 DF=0.000 sa5.d 227.0000 288.9000 512.4000 578.4000 429.3000 473.3000 385.3000 341.2000 534.4000 159.0000 135.1000 270.9000 Counts vs. 质荷比 (m/z)
8	x10 5 -ESI 扫描 (rt: 17.447 min) Frag=135.0V CF=0.000 DF=0.000 sa3.d 274.2000 318.3000 230.2000 340.3000 296.2000 163.1000 384.3000 427.2000 492.8000 568.8000 Counts vs. 质荷比 (m/z)

9	
10,11	
12	
13	
14	
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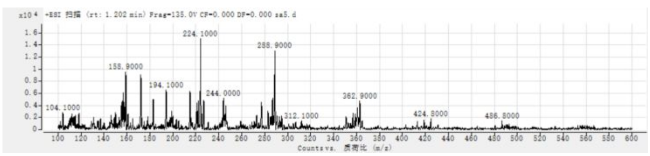
16	
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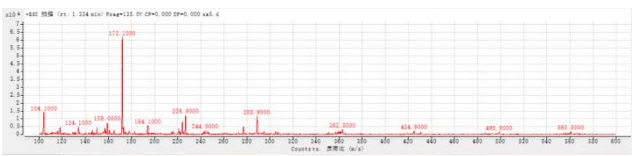
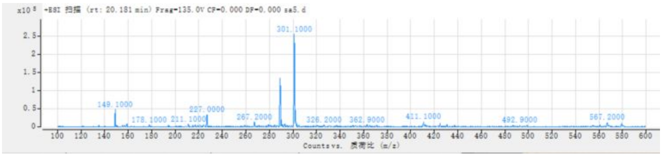
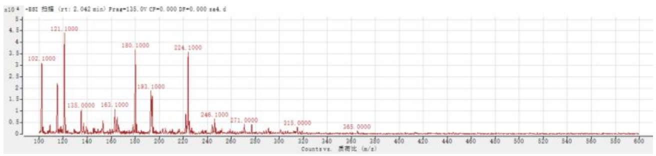
18	

19	x10 5 +ESI 扫描 (rt: 20.181 min) Frag=135.0V CF=0.000 DF=0.000 sa5.d 301.1000 149.1000 178.1000 211.1000 227.0000 267.2000 326.2000 362.9000 411.1000 492.9000 567.2000 Counts vs. 质荷比 (m/z)
20	x10 4 +ESI 扫描 (rt: 2.042 min) Frag=135.0V CF=0.000 DF=0.000 sa4.d 121.1000 102.1000 180.1000 224.1000 193.1000 135.0000 163.1000 246.1000 271.0000 315.0000 365.0000 Counts vs. 质荷比 (m/z)