Supporting Information for

Emerging investigator series: Hetero-phase junction 1T/2H-MoS_2 nanosheets decorated by FeOOH nanoparticles for enhanced visible light photo-Fenton degradation of antibiotic

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CONTENTS

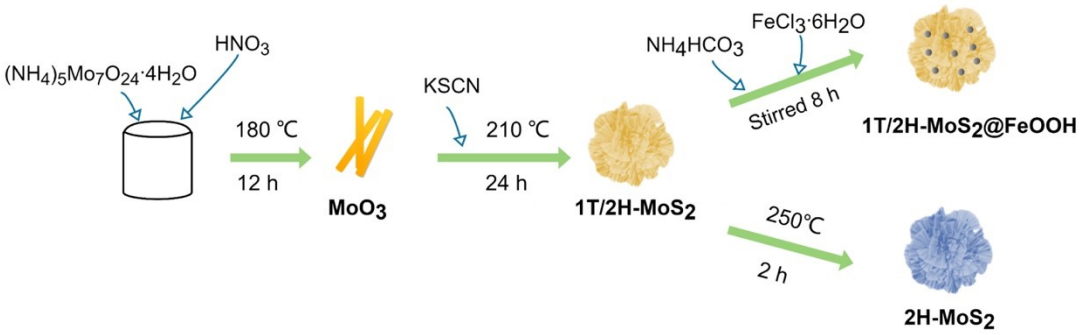


Figure S1. Synthesis route of 1T/2H-MoS_2@FeOOH.

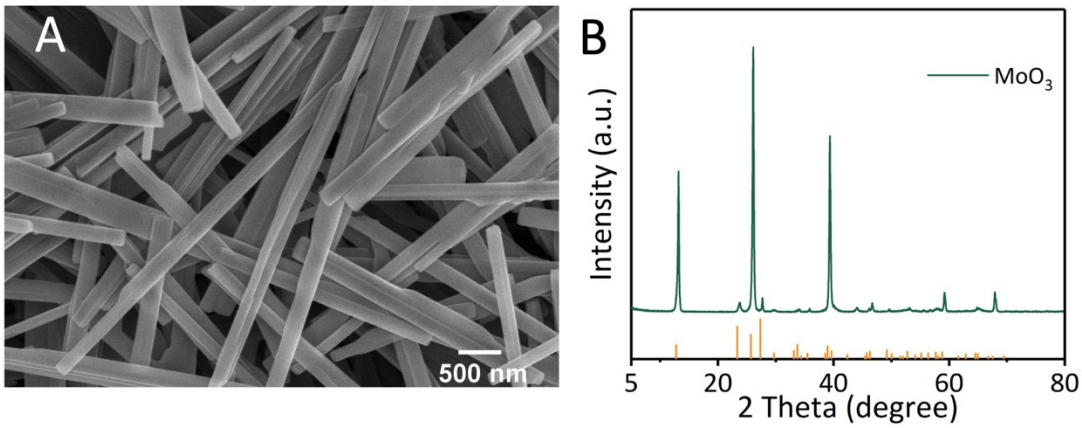


Figure S2. (A) SEM image and (B) XRD spectrum of MoO_3.

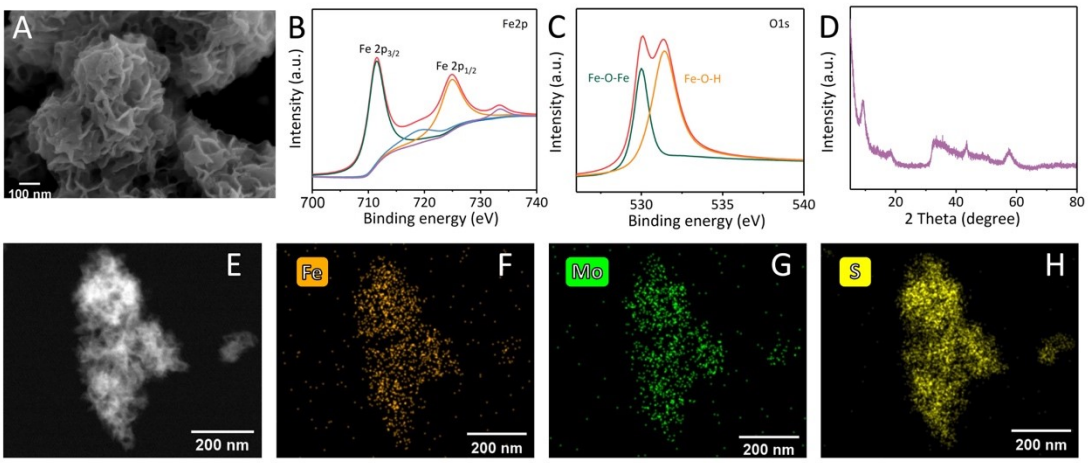


Figure S3. (A) SEM image, (B-C) XPS spectra, (D) XRD image, and (E-H) EDS mapping of 1T/2H-MoS_2@FeOOH.

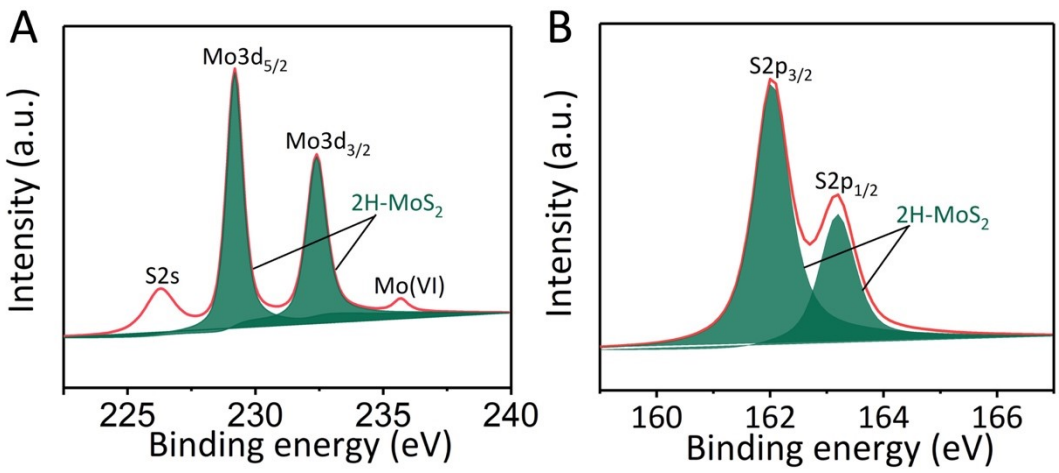


Figure S4. XPS spectra of (A) Mo3d and (B) S2p in 2H-MoS_2.

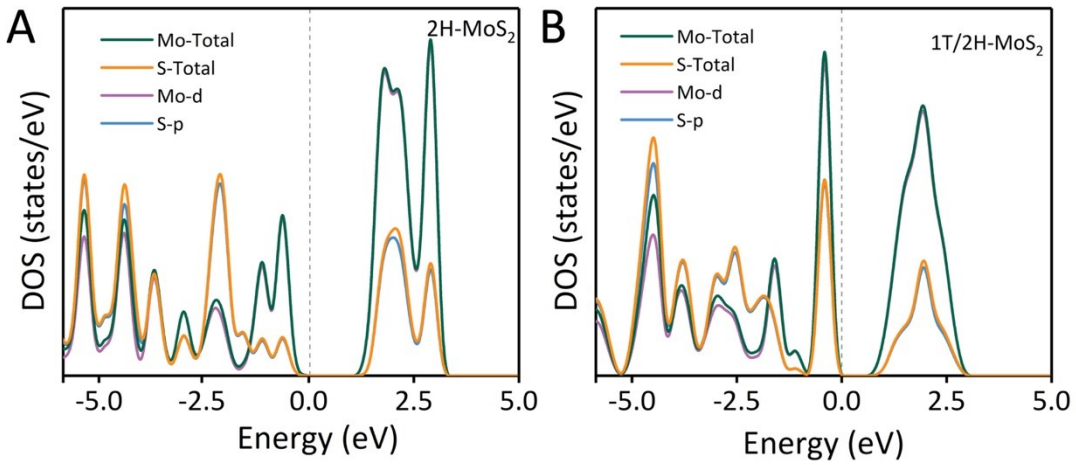


Figure S5. The electronic structures of (A) 2H-MoS_2 and (B) 1T/2H-MoS_2.

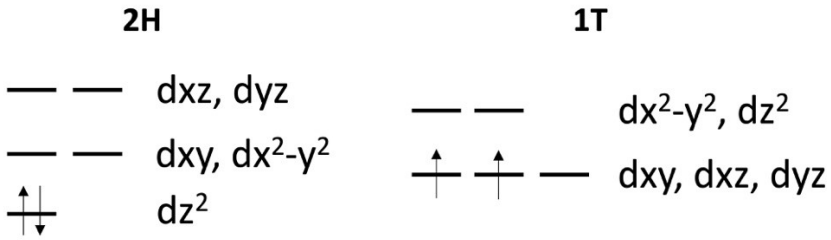


Figure S6. Distribution of Mo d orbitals of 2H-MoS_2 and 1T-MoS_2.

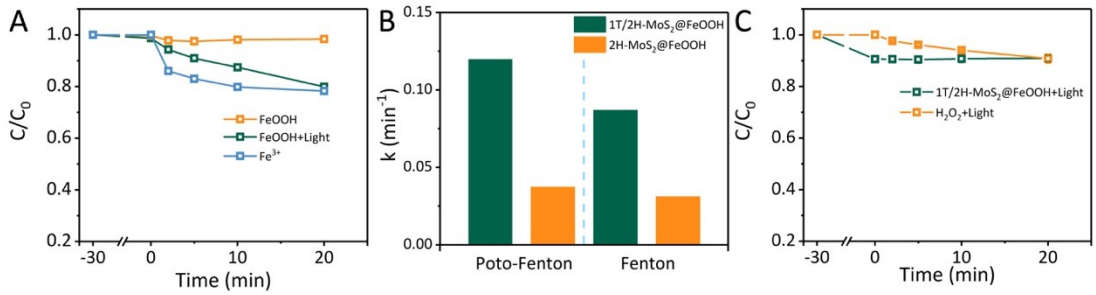


Figure S7. (A) Degradation performances of FeOOH and Fe^{3+} [Reaction conditions: 40 mL SMZ (10 mg/L), 4 mg catalyst, 10 mM H_2O_2]; (B) Degradation kinetics of the photo-Fenton and Fenton systems; (C) Degradation performances of MoS_2.

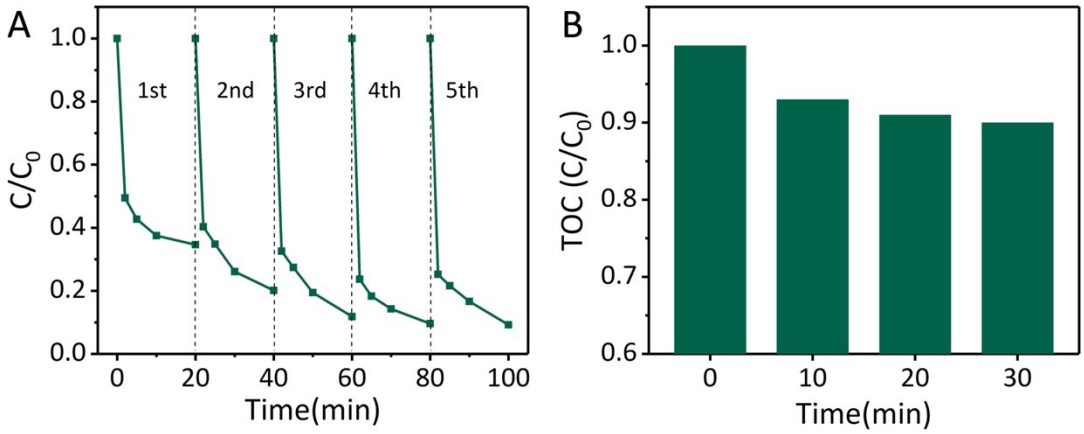


Figure S8. (A) Recycling capability of 1T/2H-MoS_2@FeOOH in photo-Fenton system; (B) TOC reduction of 1T/2H-MoS_2@FeOOH in photo-Fenton system.

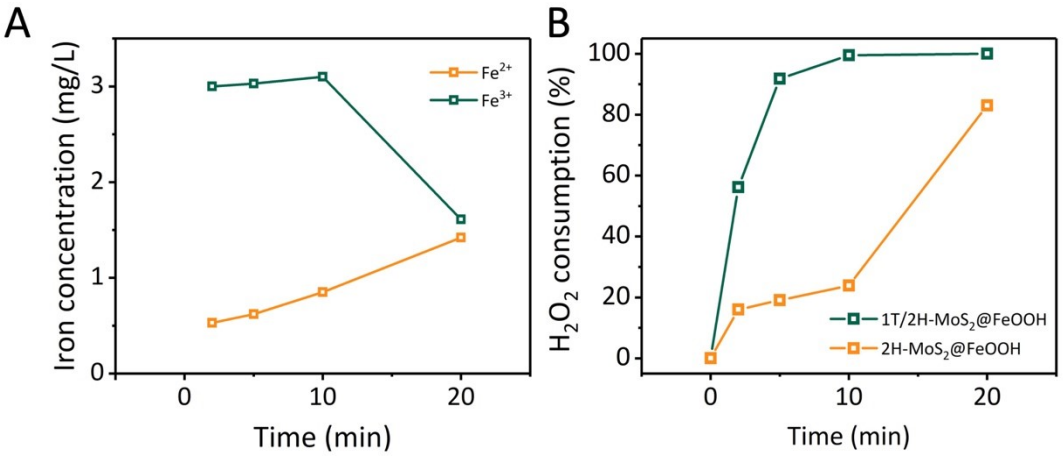


Figure S9. (A) Fe^{2+} and Fe^{3+} concentrations and (B) H_2O_2 consumption during the photo-Fenton reactions.

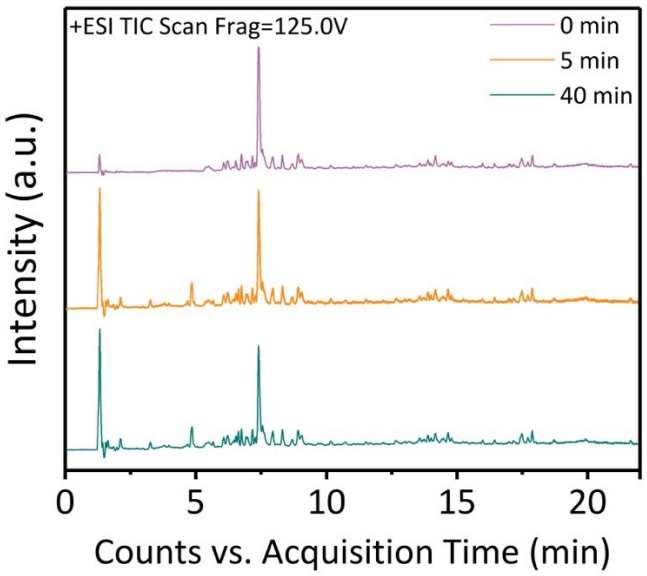
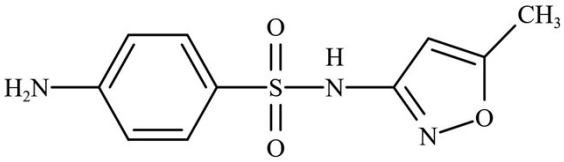
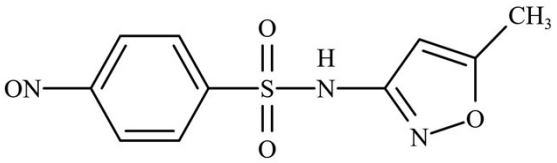
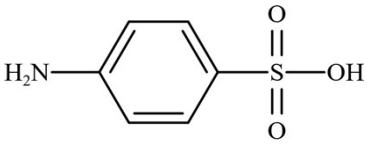
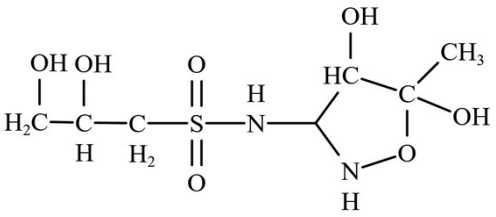
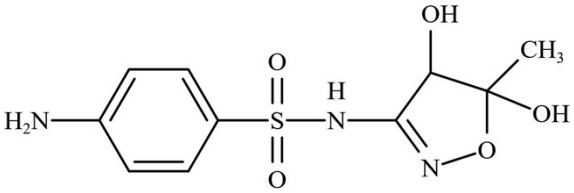
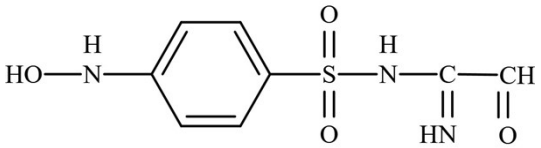
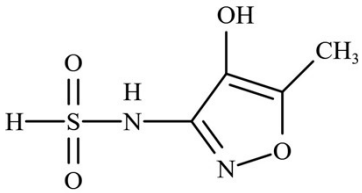
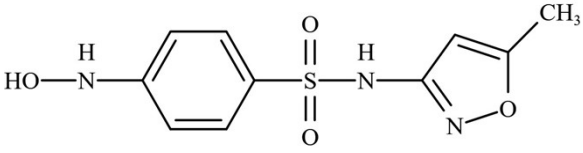


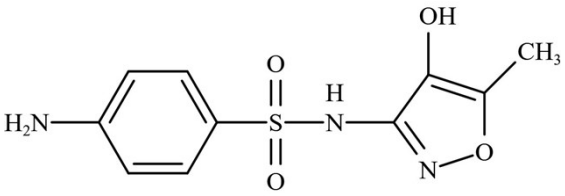
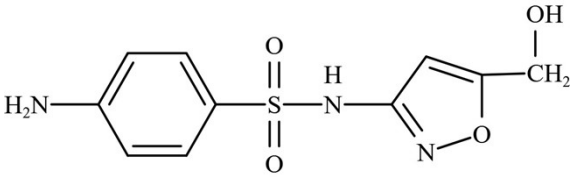
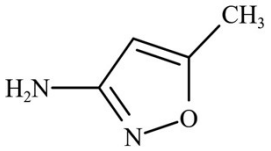
Figure S10. LC-QTOF MS/MS spectra of SMZ degradation intermediate products.

Table S1. Q-TOF MS/MS operation conditions.

Items	Conditions
Ion Mode	Jet Stream ESI Pos
Drying Gas Temperature	300 ºC
Drying Gas Flow	11 L/min
Nebulizer Pressure	45 psi
Sheath Gas Temperature	300ºC
Sheath Gas Flow	11 L/min
Capillary voltage	4000V
Nozzle voltage	300 V
Scan Speed	1.5 spectra/sec

Table S2. Molecular information of SMZ degradation intermediates determined by LC-QTOF MS/MS.

Formular	ESI(+) m/z	Retention time (min)	Molecular structure
$C_{10}H_{11}N_3O_3S$	254	7.35	
$C_{10}H_9N_3O_4S$	268	6.40	
$C_6H_7NO_3S$	174	2.97	
$C_7H_{16}N_2O_7S$	273	4.60	
$C_{10}H_{13}N_3O_5S$	288	4.66	
$C_8H_9N_3O_4S$	244	3.27	
$C_4H_6N_2O_4S$	179	1.91	
$C_{10}H_{11}N_3O_4S$	270	7.18	

$C_{10}H_{11}N_3O_4S$	270	5.83	
$C_{10}H_{11}N_3O_4S$	270	4.66	
$C_4H_6N_2O$	99	4.88	
$C_4H_{11}NO$	90	1.57