Electronic Supplementary Information

Enhanced visible-light-driven RhB removal with Mo-Ni bimetallistic sulfide/g-C$_3$N$_4$ nanosheets Schottky junction

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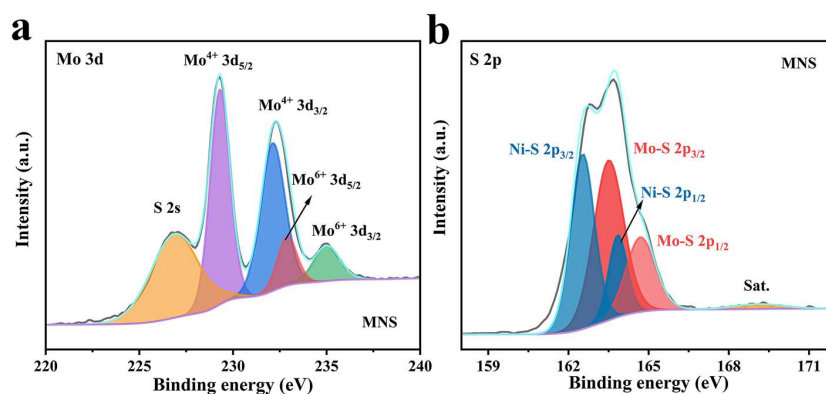
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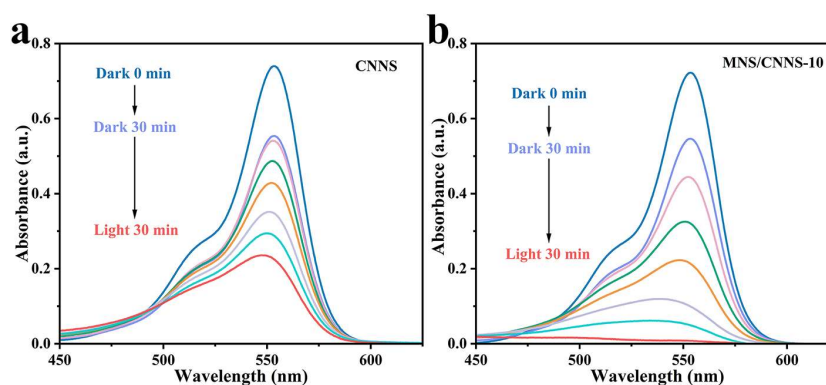
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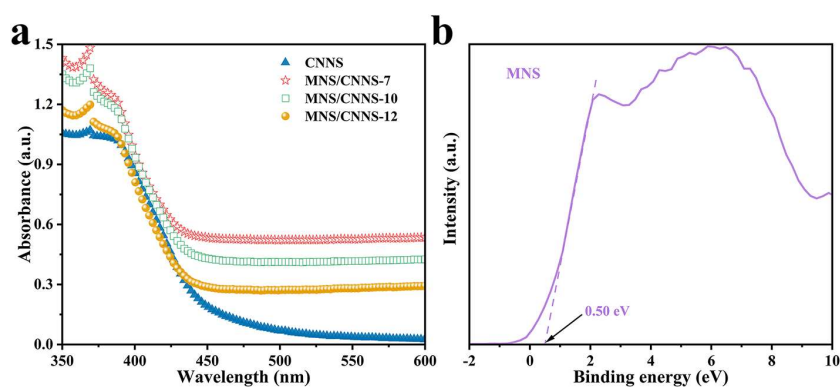E-mail: xufen@guet.edu.cn (F. Xu), sunlx@guet.edu.cn (L. X. Sun)
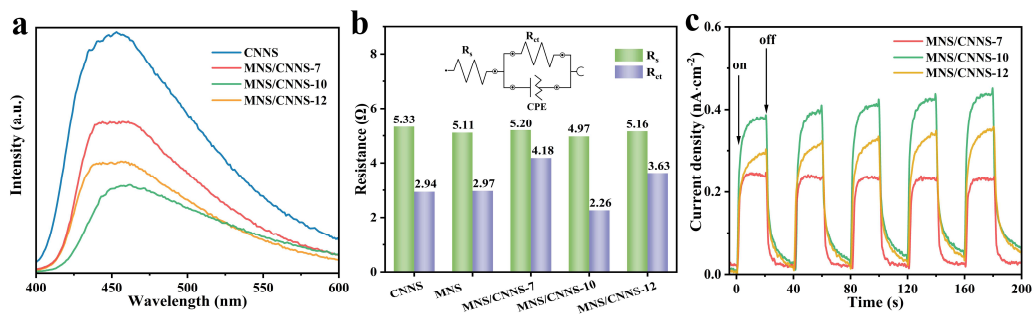
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Fig. S1. XPS spectra of Mo 3d (a) and S 2p (b) of MNS.

Fig. S2. The UV-vis absorption of CNNS (a) and MNS/CNNS-10 (b).

Fig. S3. (a) UV-vis DRS of samples; (b) XPS valence of MNS.

Fig. S4. PL (a), R_s and R_{ct} values (b) and the transient photocurrent responses (c) for as-prepared samples, inset shows the relative fitting circuit diagram.

Table S1 XPS analysis of S 2p for MNS and MNS/CNNS-10.

Samples	Binding energy (eV)	Assignment	Peak-area percentage (%)
MNS	162.5	Ni−S 2p$_{3/2}$	39.0
	163.5	Mo−S 2p$_{3/2}$	23.9
	163.8	Ni−S 2p$_{1/2}$	14.2
	164.7	Mo−S 2p$_{1/2}$	20.6
	169.1	Sat.	2.30
MNS/CNNS-10	162.1	Ni−S 2p$_{3/2}$	40.1
	163.0	Mo−S 2p$_{3/2}$	15.9
	163.5	Ni−S 2p$_{1/2}$	20.3
	164.5	Mo−S 2p$_{1/2}$	8.90
	168.8	Sat.	14.8

Table S2 BET surface area, average BJH pore size, and pore volume of CN, CNNS, MNS and MNS/CNNS-x.

Sample	Pore volume (cm^3·g^{-1})	Pore diameter (nm)	BET surface area (m^2·g^{-1})
CNNS	2.166	0.82	251.7
MNS	0.177	0.822	32.8
MNS/CNNS-7	0.303	0.822	38.1
MNS/CNNS-10	0.573	3.415	76.1
MNS/CNNS-12	0.120	3.425	83.6

Table S3 Absorption edge and potentials of CNNS, MNS and MNS/CNNS-x.

Sample	Wavelength (nm)	VB (eV)	VB (V vs NHE)	Bandgap (eV)	CB (V vs NHE)
CNNS	454	1.25	1.31	2.61	-1.30
MNS	398	0.50	0.56	1.29	-0.73
MNS/CNNS-7	427	1.29	1.35	2.71	-1.36
MNS/CNNS-10	435	1.24	1.3	2.71	-1.41
MNS/CNNS-12	436	1.20	1.26	2.76	-1.5

Table S4 Fluorescence lifetime parameter of CNNS composites.

Catalysts	Lifetime (ns)		Pre-exponential factors B (%)		Average lifetime, τ (ns)
	τ_1	τ_2	B_1	B_2	
CNNS	1.8994	11.5951	58.86	41.14	5.89
MNS/CNNS-7	1.8705	12.0149	56.13	43.87	6.32
MNS/CNNS-10	2.0811	14.6712	61.89	38.11	6.88
MNS/CNNS-12	1.9861	11.7246	57.09	42.91	6.16