

Supplemental Information:

Fig. S1 (a)-(b) TEM images, (c)-(d) HRTEM images of the interface between WO₃ and PANI with different measurement condition for WO₃/PANI hybrid structure

Fig. S2 The IPCE plots in the range of 350~600 nm measured at 1.23 V vs RHE for bare WO₃ and WO₃/PANI hybrid heterojunction

Fig. S3 The dark I-T curves measured at 1.23 V vs. RHE for 300s

Fig. S4 The cyclic voltammogram curves of pure WO₃ and WO₃ hybrid photoelectrode

Fig. S5 The curves of photovoltage with time for bare WO₃ and WO₃/PANI

Fig. S6 The Mott-Schottky curves measured with the frequency of (a) 3000 Hz and (b) 5000 Hz under dark

Fig. S7 The schematic diagram for bending of energy band and extender depletion layer at the interface of photoelectrode/electrolyte

Fig. S8 (a)-(b) The LSV curves and EIS measurements of all as-obtained WO₃/PANI hybrid heterojunction, (c) the results of M-S measurements of WO₃/PANI-30s and WO₃/PANI-90s

Tab. S1 The V_{FB} and N_d of bare WO₃ and WO₃/PANI hybrid heterojunction through M-S measurements with frequency of 3000 Hz and 5000 Hz under dark

Tab. S2 The values of all parameters for the fitting circuit diagram of EIS measured without illumination and with illumination

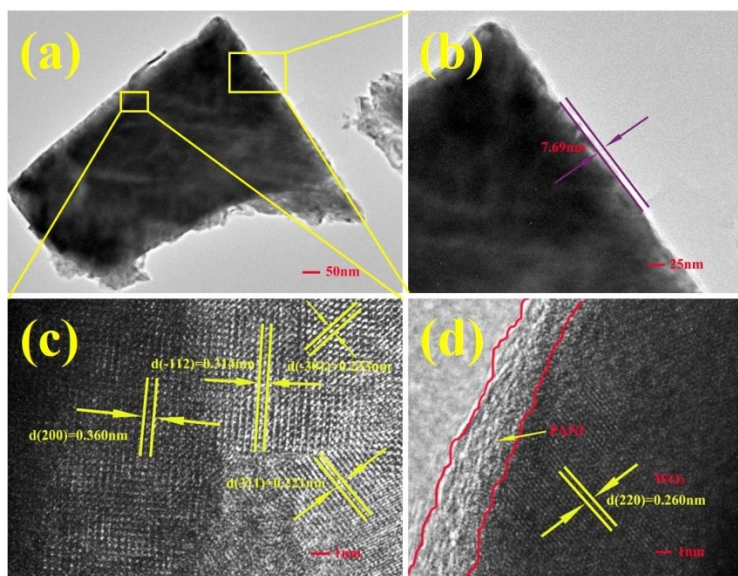


Fig. S1 (a)-(b) TEM images, (c)-(d) HRTEM images of the interface between WO_3 and PANI with different measurement condition for WO_3/PANI hybrid structure

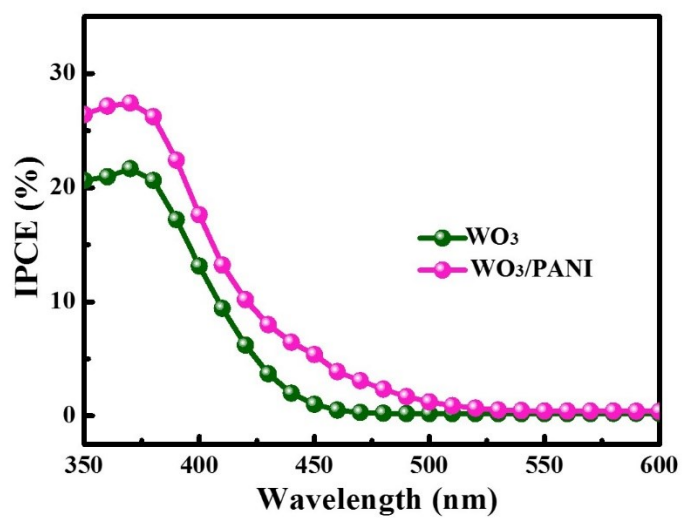


Fig. S2 The IPCE plots in the range of 350~600 nm measured at 1.23 V vs RHE for bare WO_3 and WO_3/PANI hybrid heterojunction

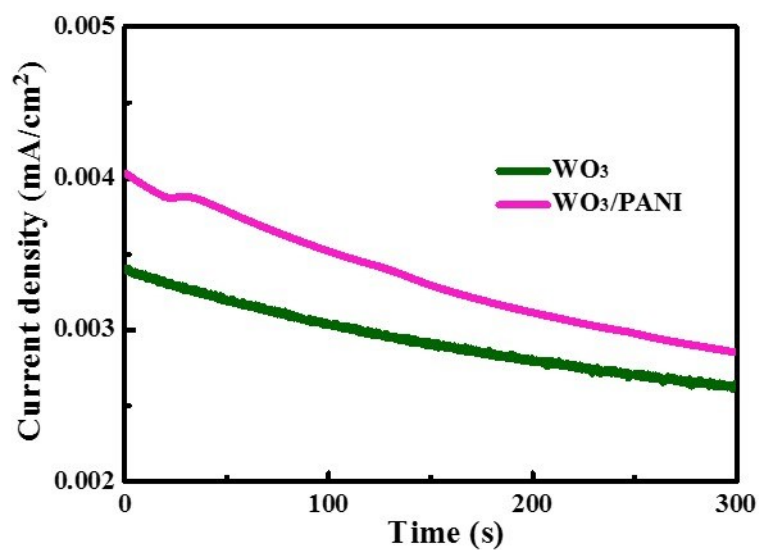


Fig. S3 The dark I-T curves measured at 1.23 V vs. RHE for 300s

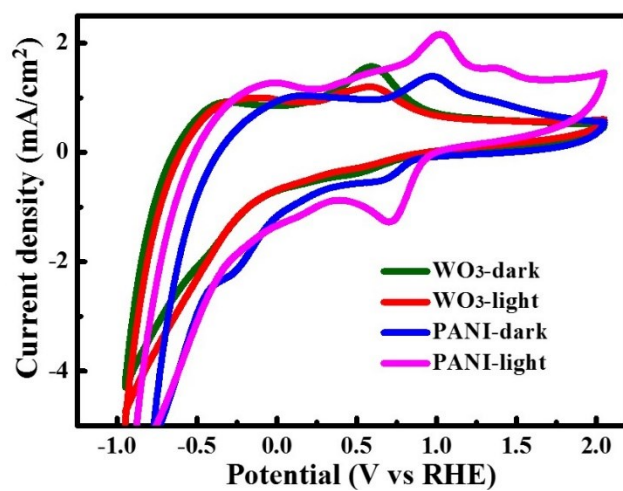


Fig. S4 The cyclic voltammogram curves of pure WO₃ and WO₃ hybrid photoelectrode

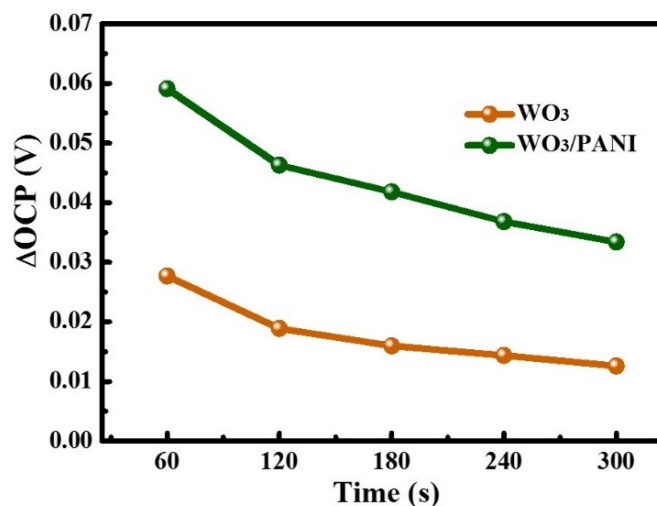


Fig. S5 The curves of photovoltage with time for bare WO₃ and WO₃/PANI

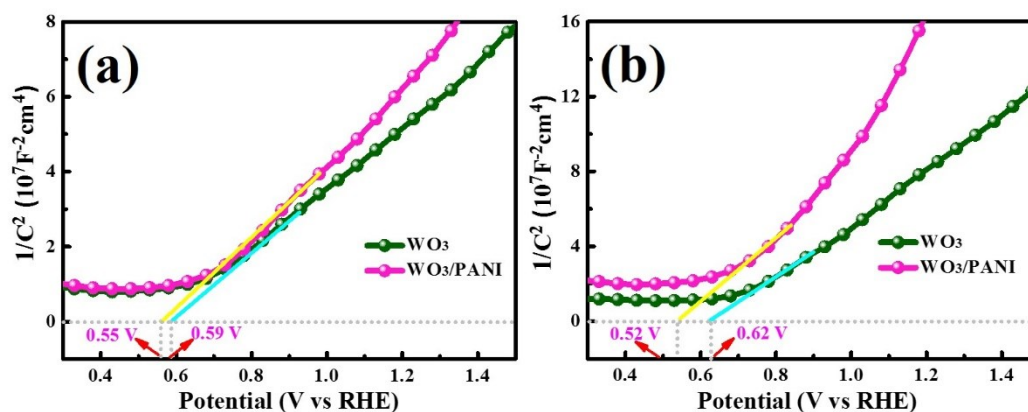


Fig. S6 The Mott-Schottky curves measured with the frequency of (a) 3000 Hz and (b) 5000 Hz under dark

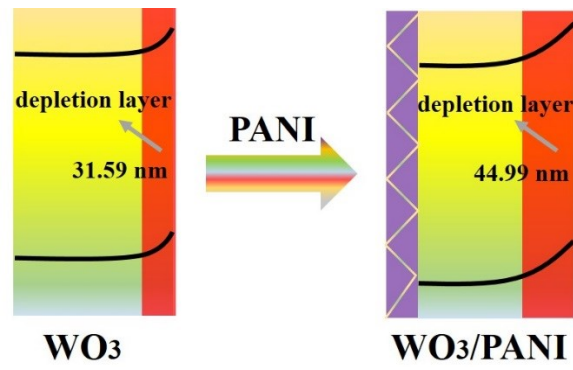


Fig. S7 The schematic diagram for bending of energy band and extender depletion layer at the interface of photoelectrode/electrolyte

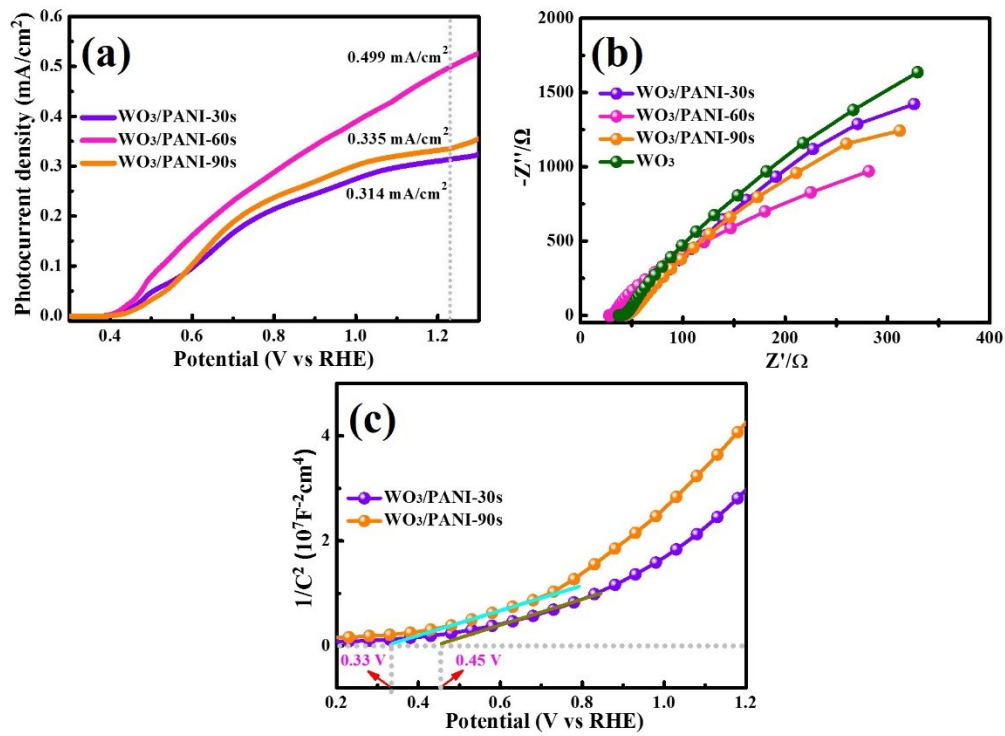


Fig. S8 (a)-(b) The LSV curves and EIS measurements of all as-obtained WO₃/PANI hybrid heterojunction, (c) the results of M-S measurements of WO₃/PANI-30s and WO₃/PANI-90s

Tab. S1 The V_{FB} and N_d of bare WO_3 and $WO_3/PANI$ hybrid heterojunction through M-S measurements with frequency of 3000 Hz and 5000 Hz under dark

3000 Hz	Workelectrode	V_{FB} (V vs RHE)	N_d (cm^{-3})
	WO_3	0.59	5.60×10^{21}
$WO_3/PANI$	0.55	4.40×10^{21}	
5000 Hz	Workelectrode	V_{FB} (V vs RHE)	N_d (cm^{-3})
	WO_3	0.62	3.68×10^{21}
$WO_3/PANI$	0.52	2.72×10^{21}	

Tab. S2 The values of all parameters for the fitting circuit diagram of EIS measured without illumination and with illumination

Dark	Workelectrode	R_s (Ωcm^2)	R_{int} (Ωcm^2)	CPE_1 (F/ cm^2)	R_{pt} (Ωcm^2)	CPE_2 (F/ cm^2)
	WO_3	39.16	3.52	9.88×10^{-6}	235.2	7.28×10^{-5}
$WO_3/PANI$	29.53	2.08	5.78×10^{-6}	194.1	1.23×10^{-5}	
Light	Workelectrode	R_s (Ωcm^2)	R_{int} (Ωcm^2)	CPE_1 (F/ cm^2)	R_{pt} (Ωcm^2)	CPE_2 (F/ cm^2)
	WO_3	37.23	3.17	8.39×10^{-6}	144	9.28×10^{-5}
$WO_3/PANI$	30.84	2.12	5.89×10^{-6}	127	1.42×10^{-5}	