Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

$Co(OH)_x$ nanolayer integrated planar WO_3/Fe_2O_3 photoanode for efficient photoelectrochemical water splitting

Wei Ma, Xiaofeng Wu, Keke Huang, Meng Wang, Rong Fu, Huanwen Chen and Shouhua Feng*

State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, College of Chemistry,

Jilin University, Changchun, 130012, P.R. China

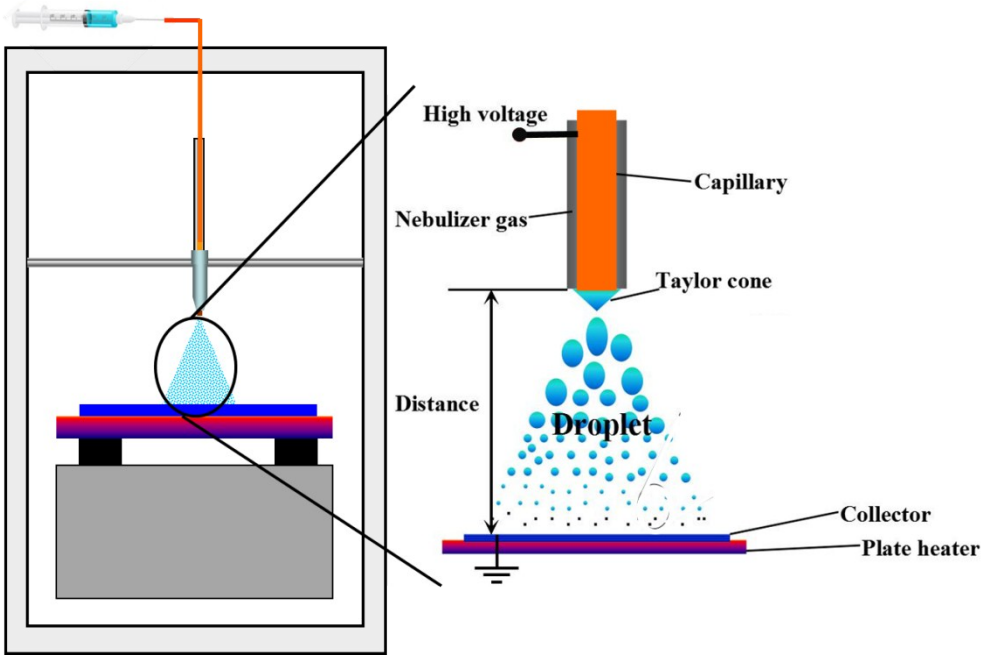

Figure S1. Schematic diagram of the experimental equipment.

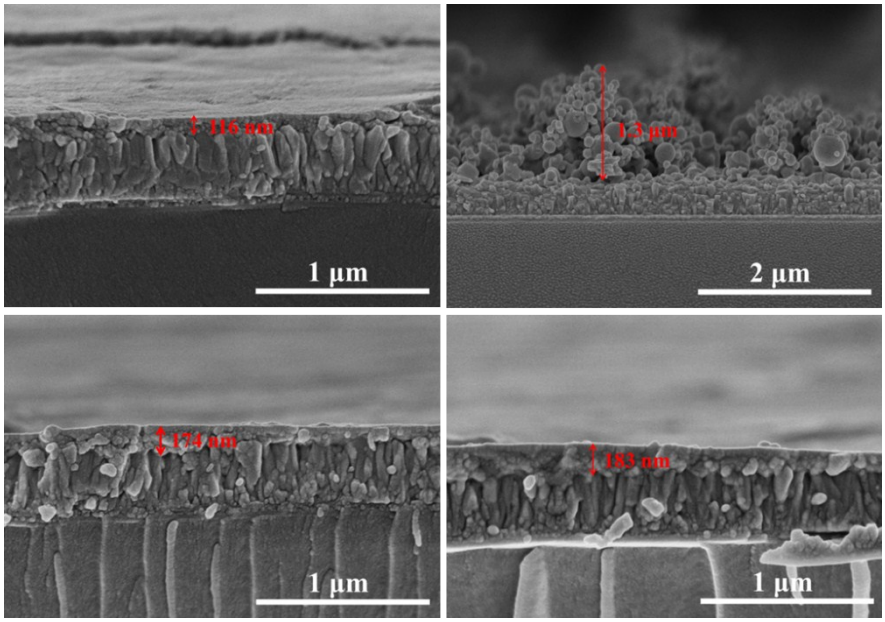

Figure S2. Cross-section SEM images of Fe_2O_3, WO_3, WO_3/Fe_2O_3, and $WO_3/Fe_2O_3/Co(OH)_x$, respectively.

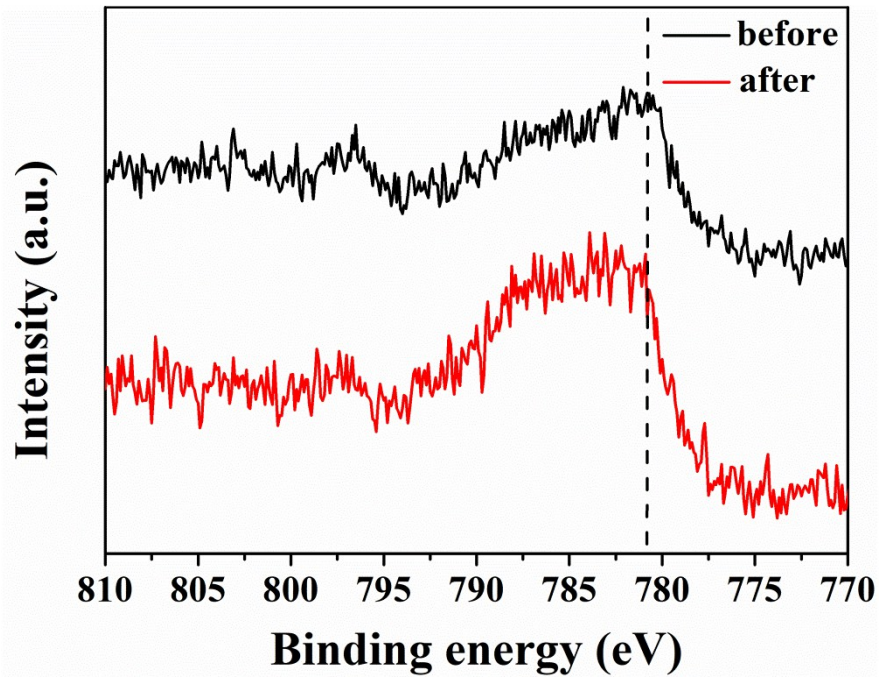

Figure S3. XPS spectra of Co2p of WO3/Fe2O3/Co(OH)x before and after PEC water splitting.

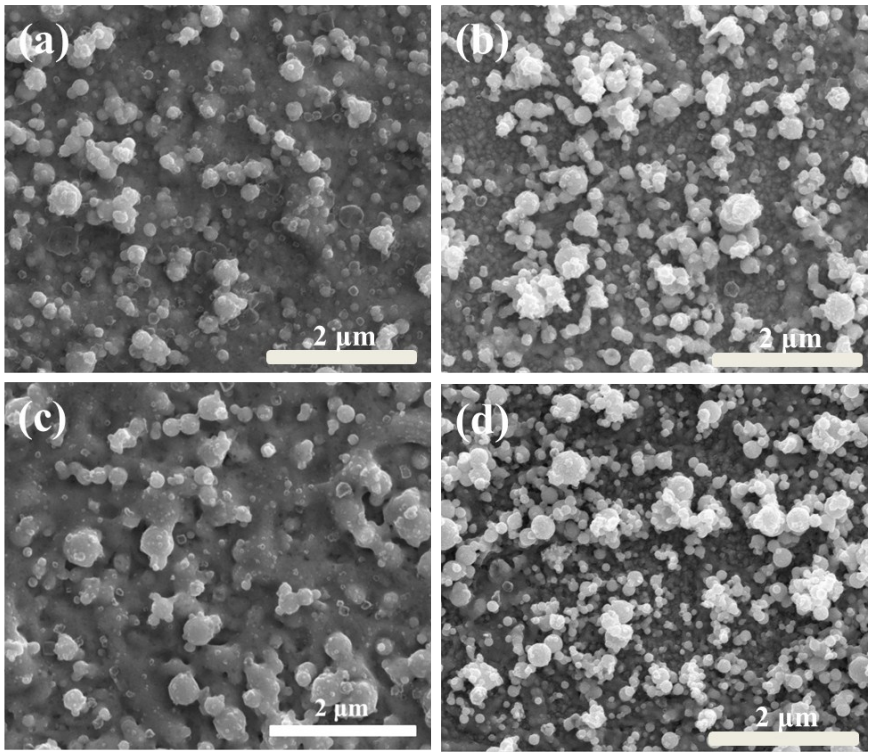

Figure S4. SEM images of WO_3/Fe_2O_3 deposited at different substrate temperature: (a) 300 °C, (b) 350 °C, (c) 400 °C and (d) 450 °C, respectively.

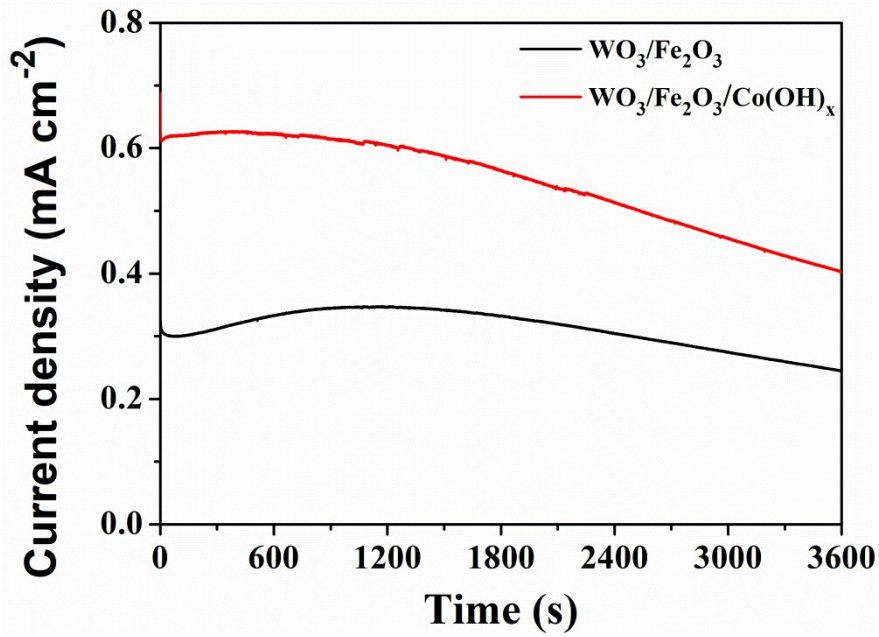

Figure S5. i-t curves of WO_3/Fe_2O_3 and $WO_3/Fe_2O_3/Co(OH)_x$ taken at 1.23 V_{RHE} in 1.0 $_M$ KOH under illumination.

Table S1 EIS simulated results of Fe_2O_3, WO_3, WO_3/Fe_2O_3, and $WO_3/Fe_2O_3/Co(OH)_x$ photoanodes

	R_s (Ω)	R_{ct} (Ω)	CPE (F)
Fe_2O_3	38.32	168690	1.2674E-5
WO_3	36.96	19695	3.2972E-5
WO_3/Fe_2O_3	41.49	3275	4.1058E-5
$WO_3/Fe_2O_3/Co(OH)_x$	34.25	2077	2.9981E-5