SUPPORTING INFORMATION

Bipolar Electrochemistry as a Simple Synthetic Route toward Nanoscale Transition of Mo_2B_5 and W_2B_5 for Enhanced Hydrogen Evolution Reaction

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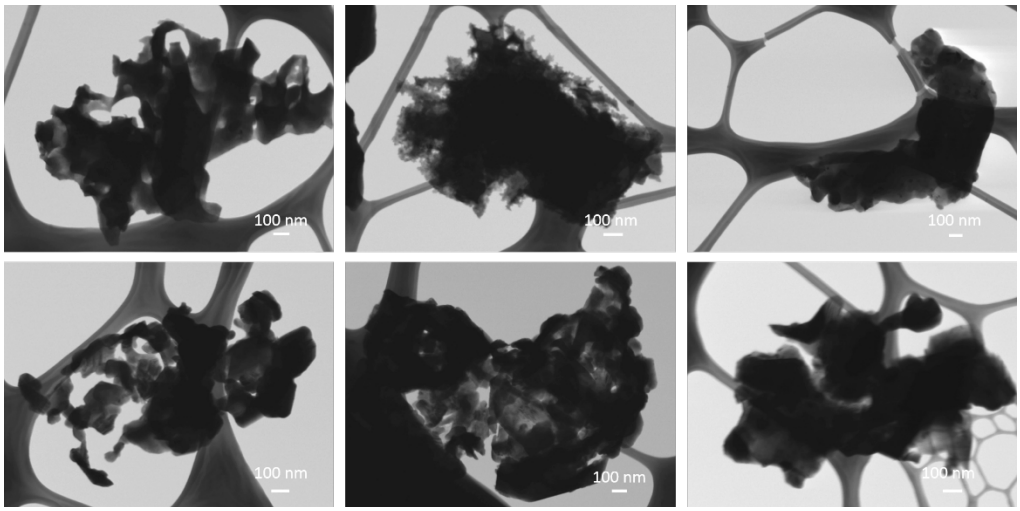

Figure S1. STEM images of BP-treated Mo_2B_5 by applying a potential of 3 V for 1800s.

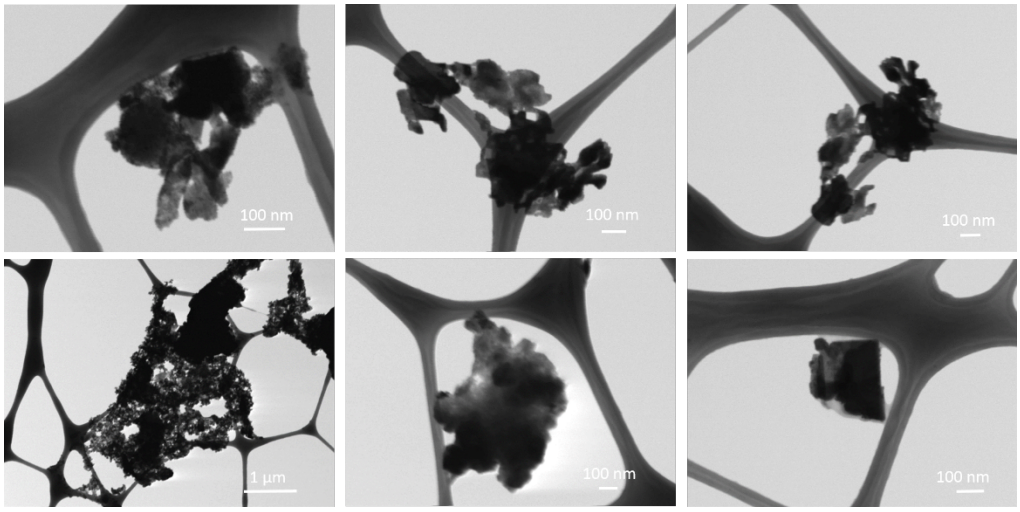

Figure S2. STEM images of BP-treated W_2B_5 by applying a potential of 3 V for 1800s.

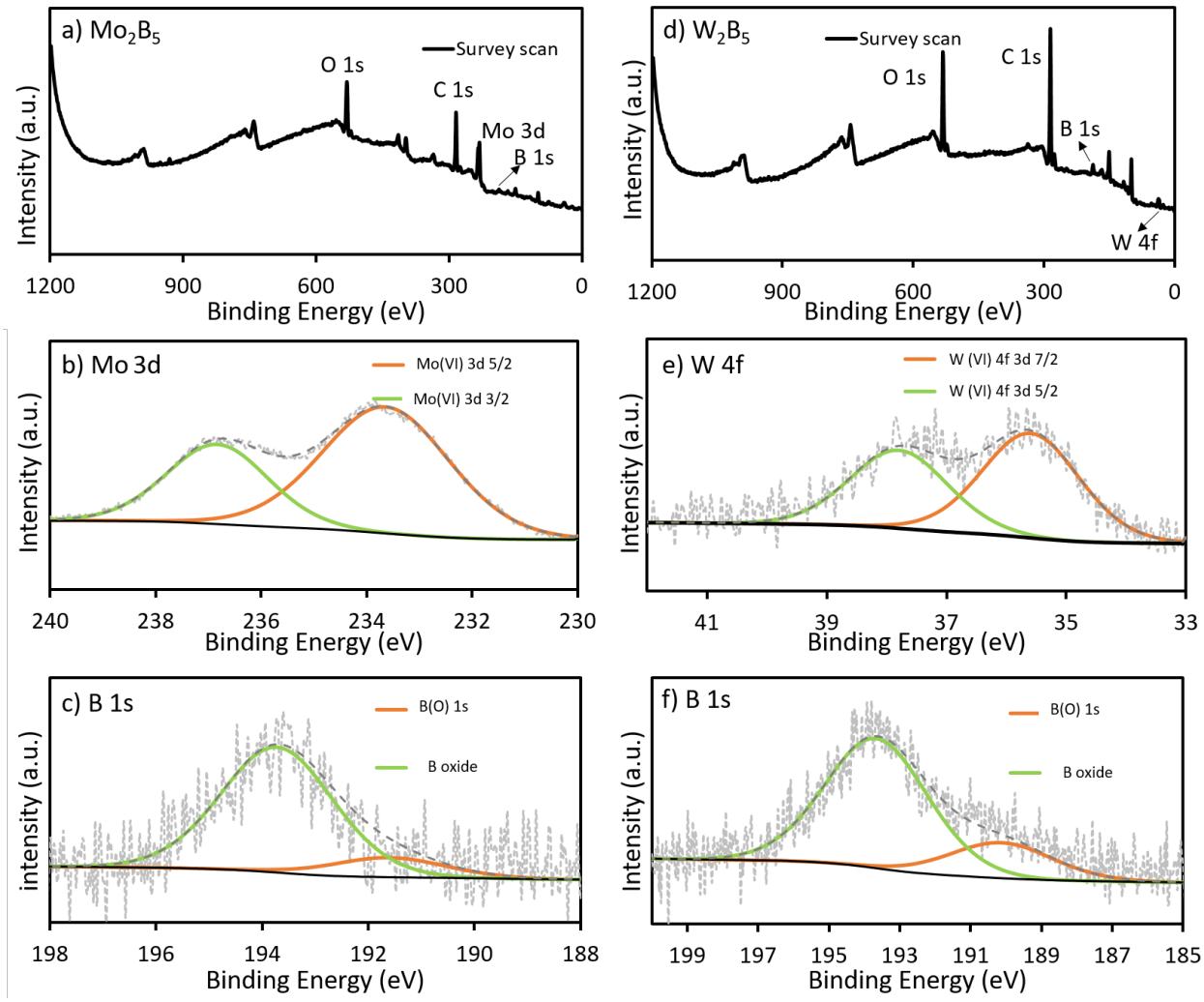

Figure S3. Survey scan and high resolution XPS spectra of Mo_2B_5 and W_2B_5 after bipolar electrochemistry treatment at 10 V for 1800s: (a) survey scan of Mo_2B_5, (b-c) high resolution XPS spectra of Mo 3d and B 1s region of Mo_2B_5, (d) survey scan of W_2B_5, (e-f) high resolution XPS spectra of W 4f and B 1s regions of W_2B_5.

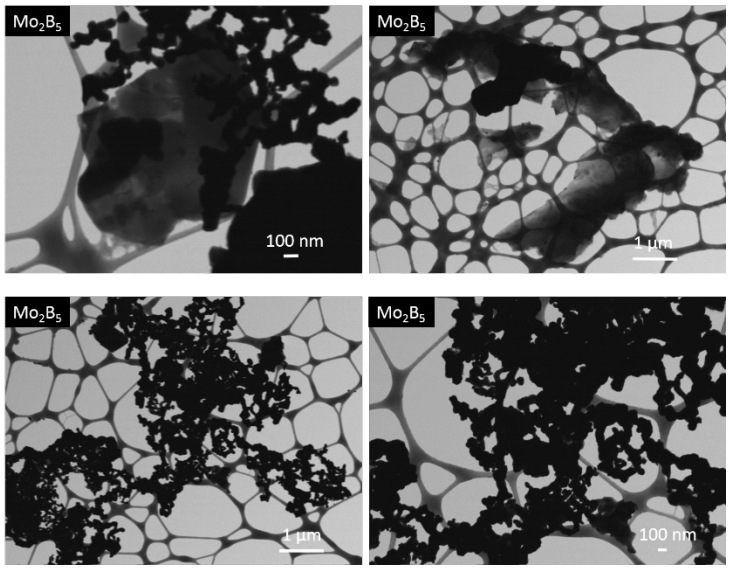

Figure S4. STEM images of bipolar electrochemistry treated Mo_2B_5 by applying a potential of 10 V for 1800s.

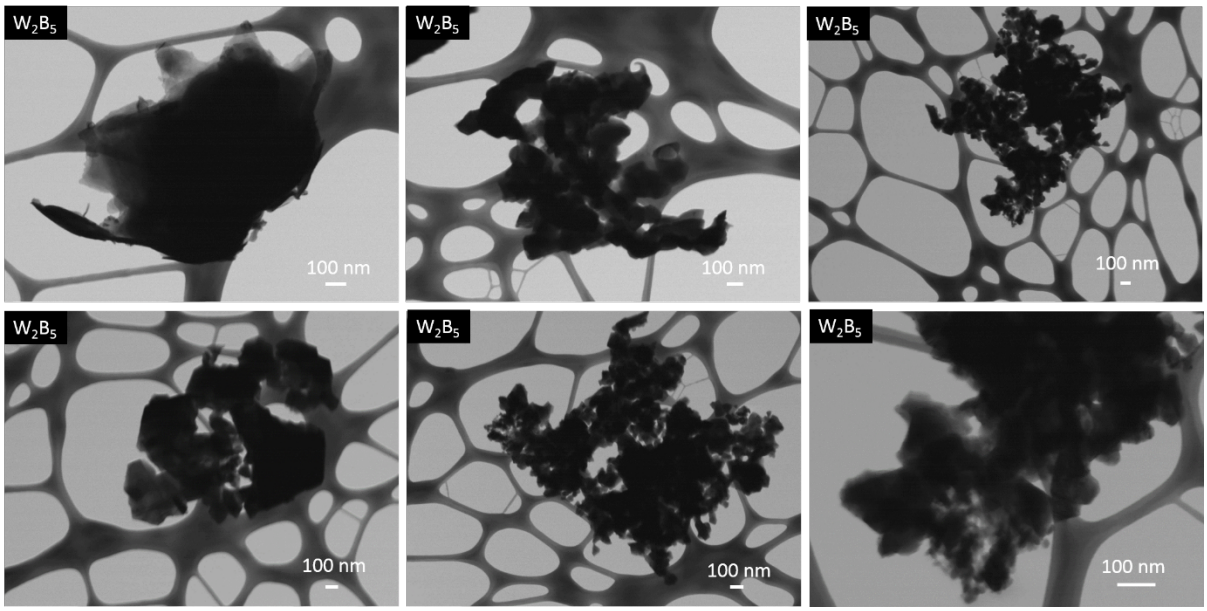

Figure S5. STEM images of bipolar electrochemistry treated W_2B_5 by applying a potential of 10 V for 1800s.

Table S1. Comparison of non-noble metal based HER electrocatalytic activity in acidic medium with other literature.

Electrocatalyst	Electrolyte	Overpotential (mV) at 10 mA cm^{-2}	Tafel slope (mV dec^{-1})	Reference
BP-treated Mo_2B_5	0.5 M H_2SO_4	540	101	This work
BP-treated W_2B_5	0.5 M H_2SO_4	210	62.2	This work
MoB	1 M H_2SO_4	210	55	1
α-MoB_2	0.5 M H_2SO_4	149	74.2	2
Mo_2B_4	0.5 M H_2SO_4	310	80	3
MoB_2	0.5 M H_2SO_4	300	75	4
Mo_3B (film)	0.5 M H_2SO_4	249 at 20 mA cm^{-2}	52	5
MoB_2 nanoparticle	0.5 M H_2SO_4	154	49	6
MoB/g-C_3N_4	1 M KOH	133	46	7
MoP	0.5 M H_2SO_4	180 at 30 mA cm^{-2}	54	8
Mo_2C	0.5 M H_2SO_4	208	56	1
MoN	0.5 M H_2SO_4	300 at 38.5 mA cm^{-2}	90	9
Mo_2N	0.5 M H_2SO_4	381	100	10
WP_2	0.5 M H_2SO_4	161	57	11
W_2C	1 M H_2SO_4	300 at 23 mA cm^{-2}	118	12

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