Electronic Supplementary Information

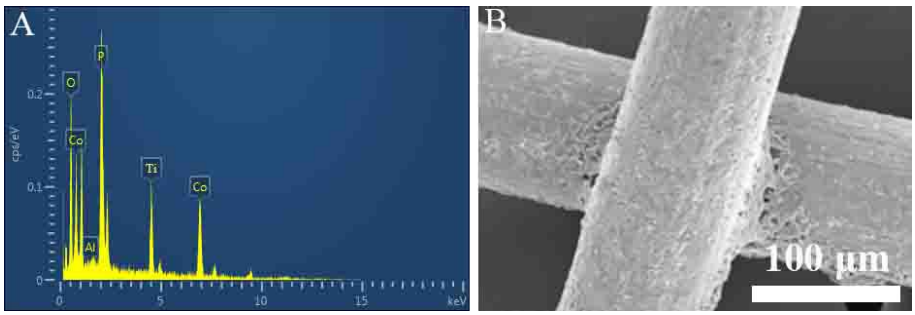

FIGURE S1| (A) EDX spectrum and **(B)** SEM image for CoAl-LDH@Co-Al-P/TM.

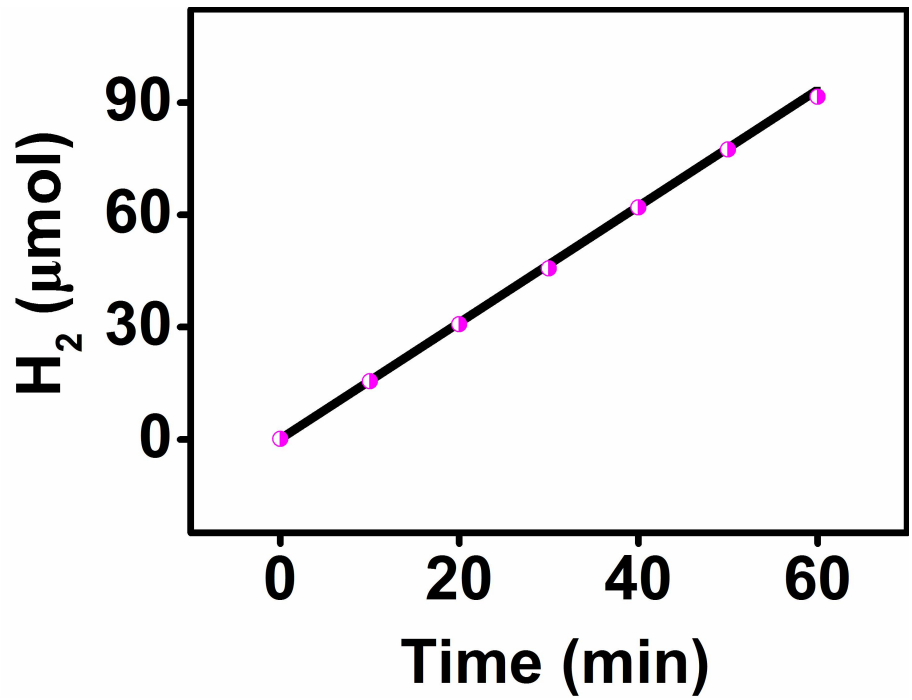

FIGURE S2| Experimentally generated (dot) and theoretically calculated (line) hydrogen amount versus time for CoAl-LDH@Co-Al-P/TM in 1 M PBS.

Table S1. Comparison of HER performance for CoAl-LDH@Co-Al-P/TM with other non-noble-metal electrocatalysts in 1 M PBS.

Catalyst	j (mA cm^{-2})	η (mV)	Electrolyte	Ref.
CoAl-LDH@Co-Al-P/TM	10	150	1 M PBS	This work
Co-NCNT/CC	10	170	1 M PBS	1
Co-S film	10	~165	1 M PBS	2
Co_2N/TM	10	290	1 M PBS	3
FeP/Ti	10	200	1 M PBS	4
$FeMoS_4$ NRA/CC	10	204	1 M PBS	5
WP NAs/CC	10	200	1 M PBS	6
FeP NAs/CC	10	202	1 M PBS	7
np-CoP NWs/Ti	10	178	1 M PBS	8
S-$NiFe_2O_4$/NF	10	197	1 M PBS	9
Co-$Mo_{0.4}$-S	10	213	1 M PBS	10
SiO_2/PPy NTs-CFs	10	~185	1 M PBS	11
Cu PDA-3	10	290	1 M PBS	12
Ni_2P@NPCNFs	10	185.3	1 M PBS	13
Mn-FeP	10	157	1 M PBS	14
WS_2/CoS_2/CC	10	175	1 M PBS	15
CNT@NPC-900	10	440	1 M PBS	16
$MnMoO_4$ NSA/NF	10	161	1 M PBS	17

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