Electronic Supplementary Information

In-situ encapsulating abundant WP/Ni_2P heterointerfaces in N, P co-doped two-dimensional carbon frameworks for boosting hydrogen evolution electrocatalysis

Dong Liu [a, b], Guangyu Xu [a], Baomin Fan [b] * and Haitao Wang [a, c] *

[a] *School of Chemistry and Environmental Engineering, Wuhan Institute of Technology, Wuhan 430205, Hubei, P.R. China;*

[b] *Key laboratory of Processing and Quality Evaluation Technology of Green Plastics of China National Light Industry council, Beijing Technology and Business University, Beijing 100048, P.R. China.*

[c] *Engineering Research Center of Phosphorus Resources Development and Utilization of Ministry of Education, Wuhan Institute of Technology, Wuhan 430205, Hubei, P. R. China.*

***Corresponding Authors**

E-mail address: wanghaitao@wit.edu.cn (H. W), fanbaomin@btbu.edu.cn (B. Fan)

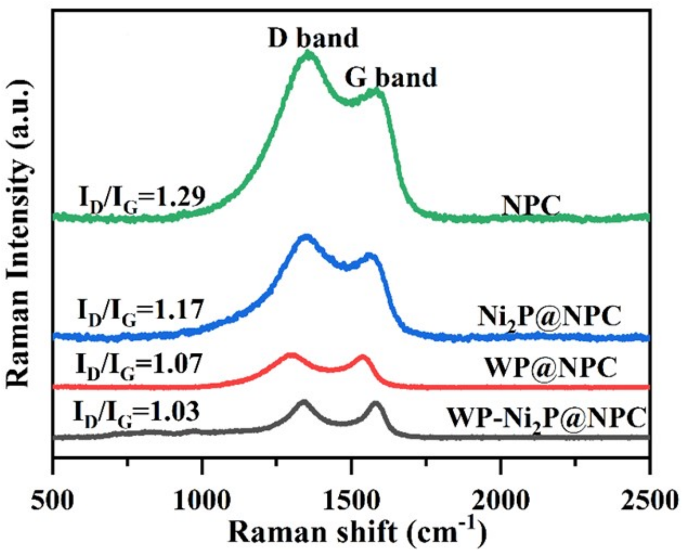

Figure S1. Raman spectra of NPC, Ni_2P@NPC, WP@NPC and WP-Ni_2P@NPC.

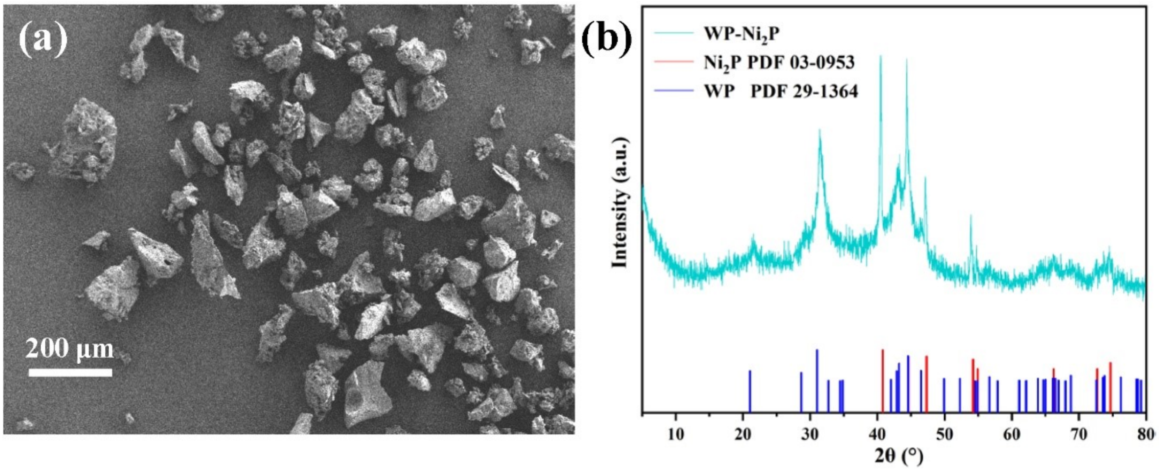

Figure S2. (a) SEM image of WP-Ni_2P. (b) XRD pattern of WP-Ni_2P.

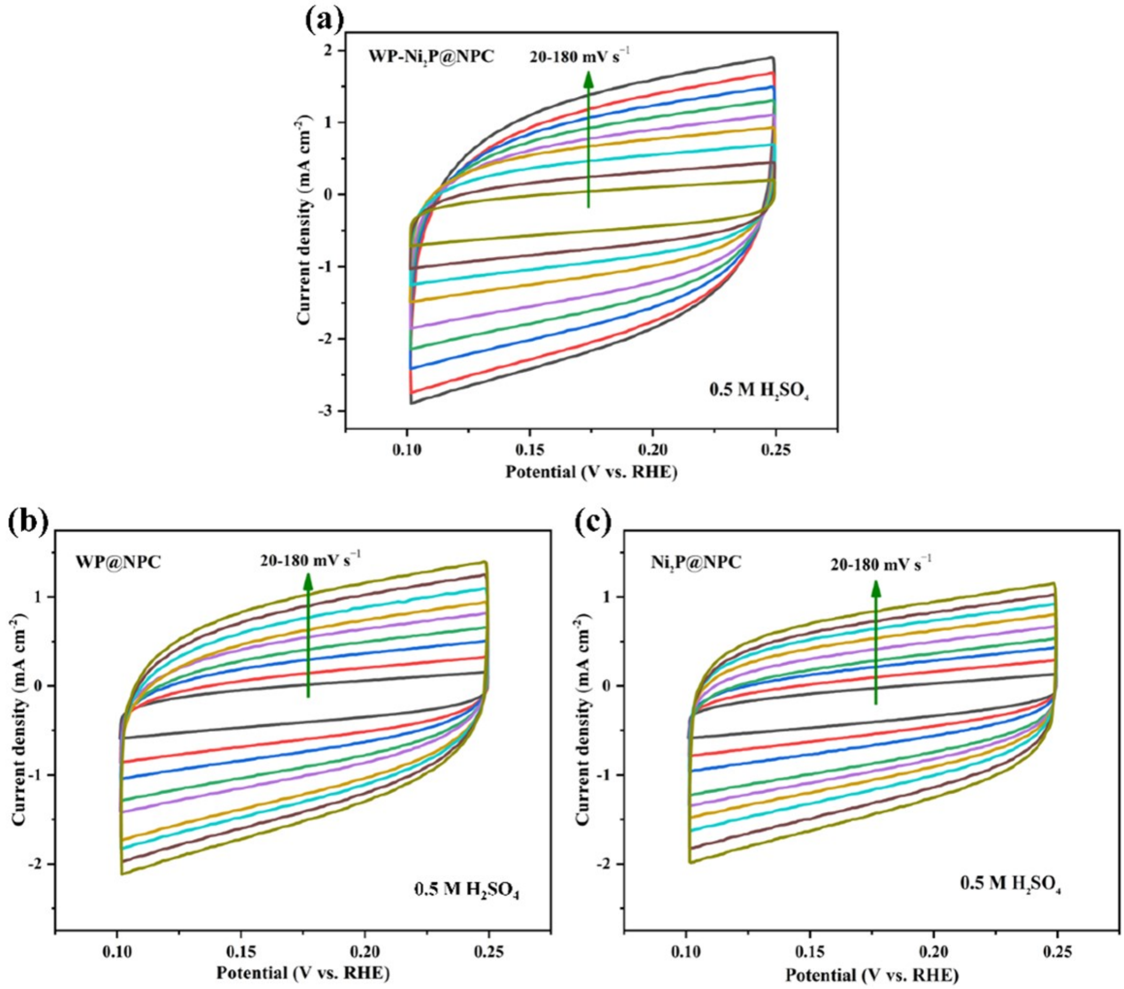

Figure S3. (a) CVs of WP-Ni_2P@NPC, (b) WP@NPC and (c) Ni_2P@NPC in the potential region of 0.1-0.25 V.

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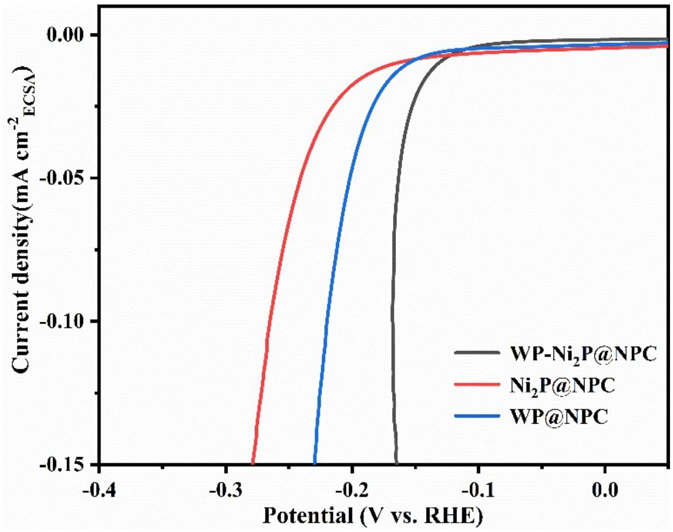

Figure S4. The LSV curve of WP-Ni_2P@NPC, WP-NPC and Ni_2P@NPC with the current density normalized by ECSA.

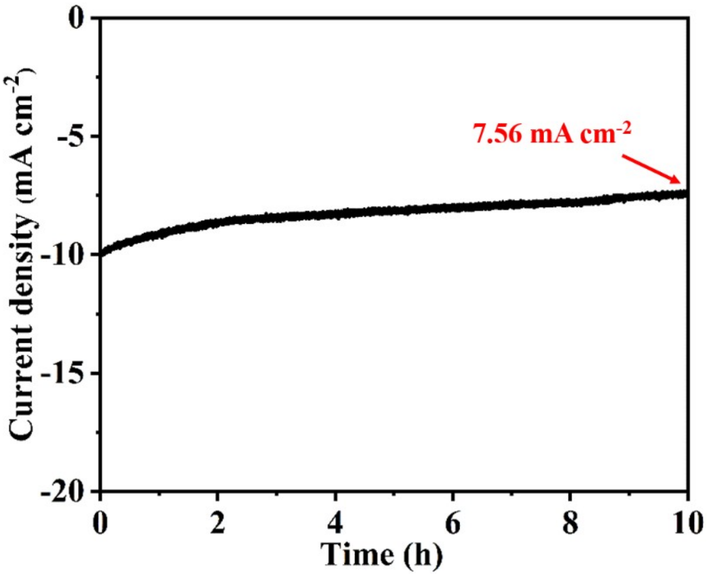

Figure S5. The chronoamperometric response of WP-Ni_2P@NPC towards HER.

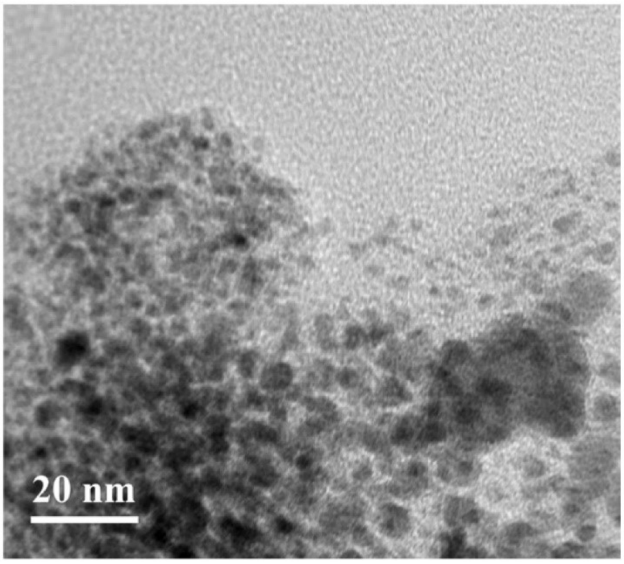

Figure S6. TEM image of WP-Ni_2P@NPC after 3000 repetitive cycles.

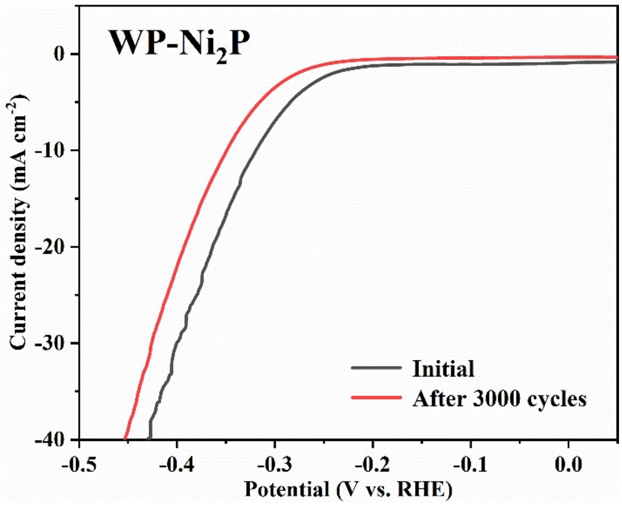

Figure S7. LSVs of WP-Ni_2P before and after 3000 repetitive cycles.

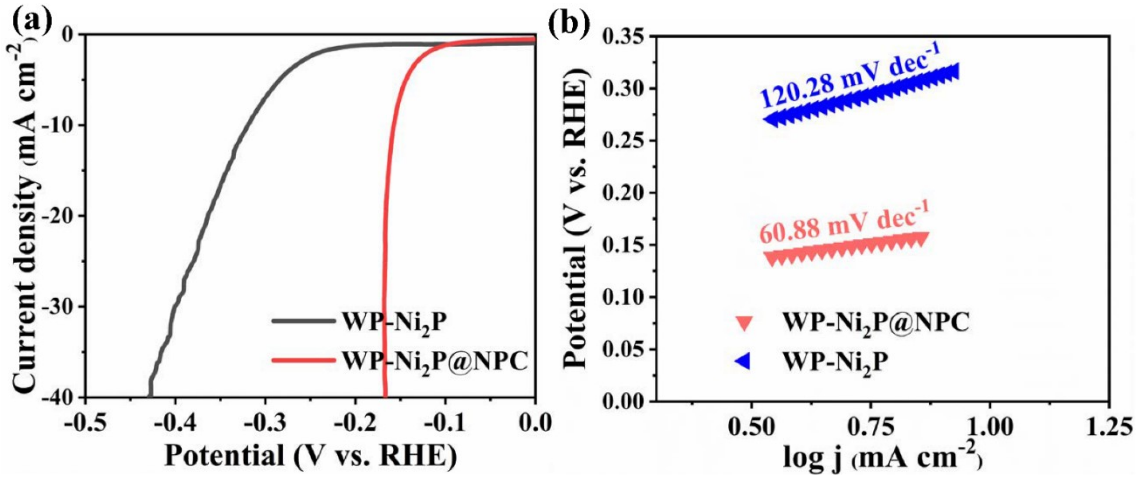

Figure S8. (a) LSVs and Tafel slopes of WP-Ni_2P@NPC and WP-Ni_2P.

Table S1 Comparison of the electrocatalytic activity of WP-Ni_2P@NPC with recently reported phosphide-based electrocatalysts for HER.

Electrocatalysts	**Overpotentials (η_{10})**	**Tafel slopes (mV dec^{-1})**	**Electrolytes**	**Ref.**
W_2C/WP@NC	196	77.4	0.5 M H_2SO_4	[1]
WP_2/NF	130	94	1 M KOH	[2]
LC-WP	170	52	0.5 M H_2SO_4	[3]
Mo-WP	175	75	1 M KOH	[4]
Mo-WP	139	65	0.5 M H_2SO_4	[4]
Mo-WP	216	90	1 M PBS	[4]
WP	314	95.71	0.5 M H_2SO_4	[5]
S-Ni_2P	290	67.1	0.5 M H_2SO_4	[6]
S-Ni_2P	331	104.1	1 M KOH	[6]
Ni_2P-WO_3	107	64.2	1 M KOH	[7]
Co_2P@Ni_2P	101	79	1 M KOH	[8]
$Ni_{12}P_5$-Ni_2P	166	60	0.5 M H_2SO_4	[9]
NiCoP	130	93	1 M KOH	[10]
MoP/MoNiP@NC	137	70	0.5 M H_2SO_4	[11]
CoP/CNTHPs	147	78.1	1 M KOH	[12]
$CoNi_xP$-CNF	154	73	1 M KOH	[13]
CCS-NiFeP-20	56	38	1 M KOH	[14]
Ni_2P-Ru_2P/NF	101	56.7	1 M KOH	[15]
Co_2P-C-NPC	151	50.2	0.5 M H_2SO_4	[16]
Ni-Co_xP	172	62.3	0.5 M H_2SO_4	[17]
WP-Ni_2P@NPC	**157**	**60.9**	**0.5 M H_2SO_4**	**This work**

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