Supporting Information

Two-Dimensional Bimetallic Phosphide Ultrathin Nanosheets as Non-Noble Electrocatalysts for Highly Efficient Oxygen Evolution Reaction

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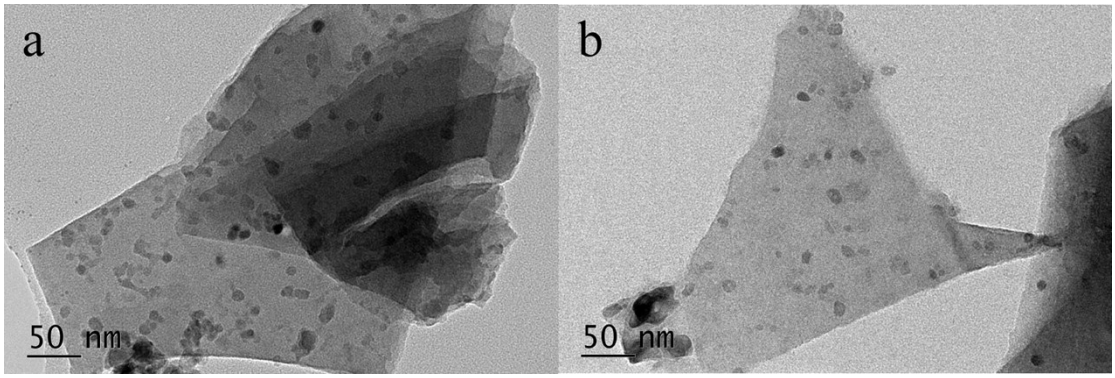

Fig. S1 TEM images of (a) $Co_{0.9}Fe_{0.1}P$ and (b) $Co_{0.7}Fe_{0.3}P$ nanosheets.

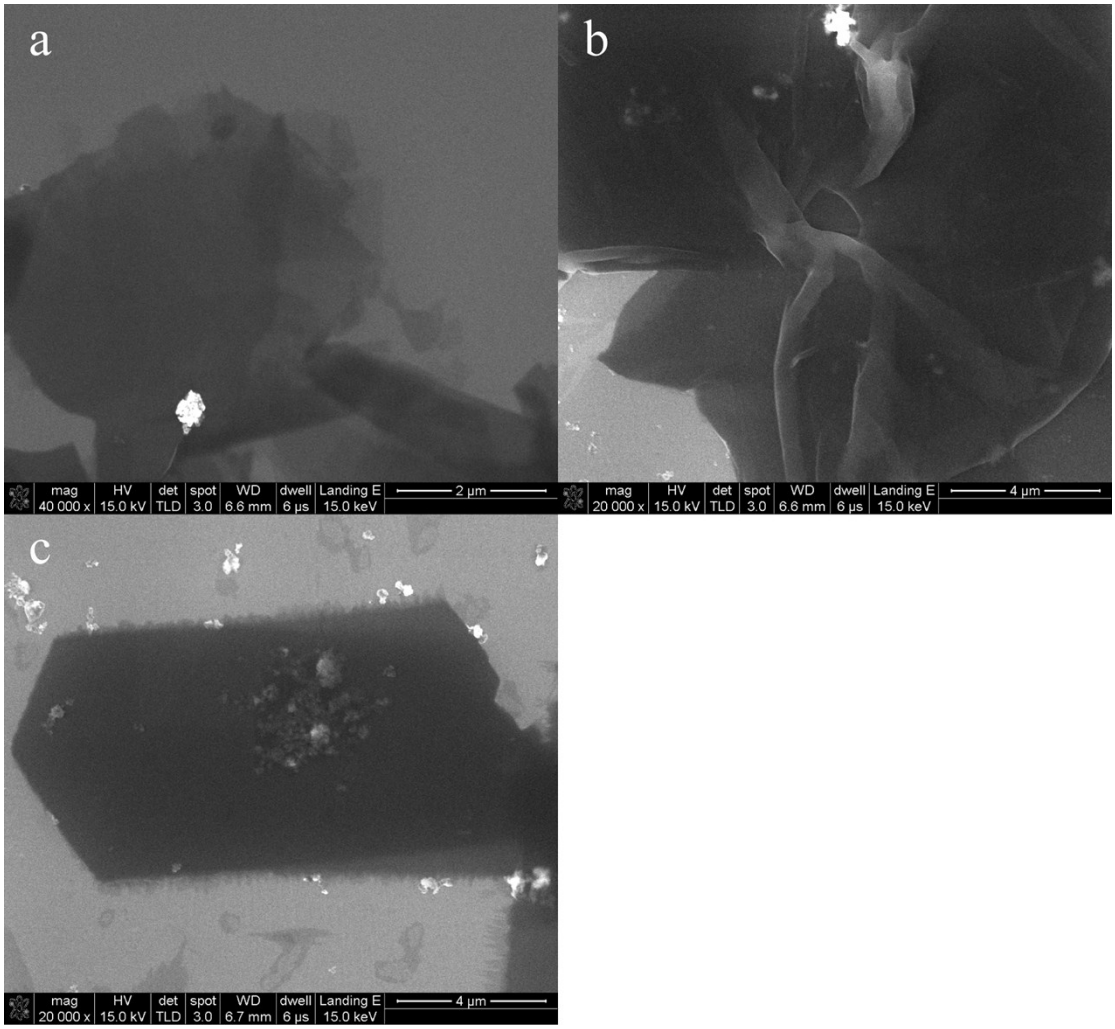

Fig. S2 SEM images of (a) CoP, (b) $Co_{0.9}Fe_{0.1}P$ and (c) $Co_{0.7}Fe_{0.3}P$ nanosheets.

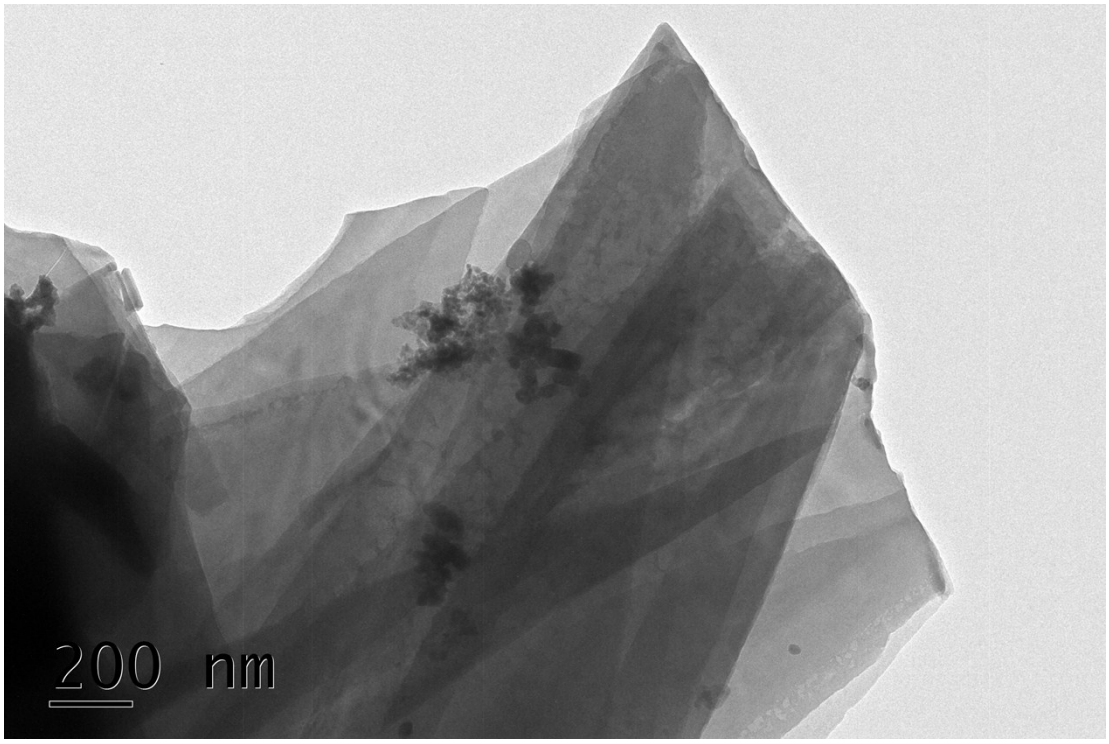

Fig. S3 TEM image of $Co_{0.8}Fe_{0.2}P$ nanosheets at low magnification.

Fig. S4 SEM image of $Co_{0.8}Fe_{0.2}P$ nanosheets at low magnification.

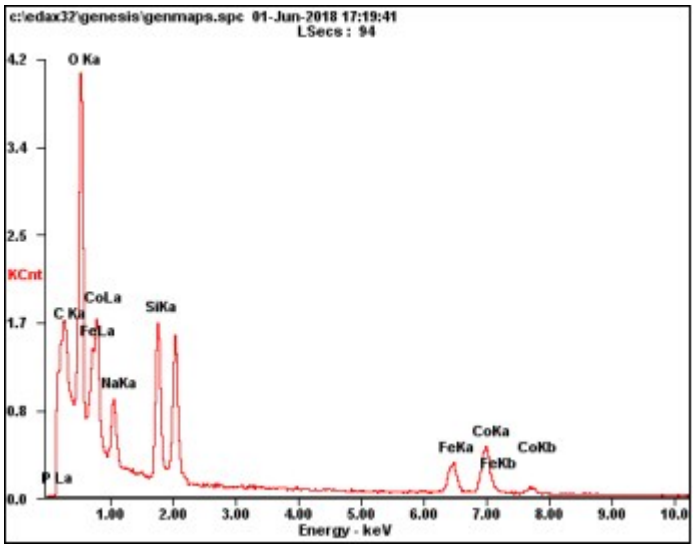

Fig. S5 EDX patterns of $Co_{0.8}Fe_{0.2}P$ nanosheets.

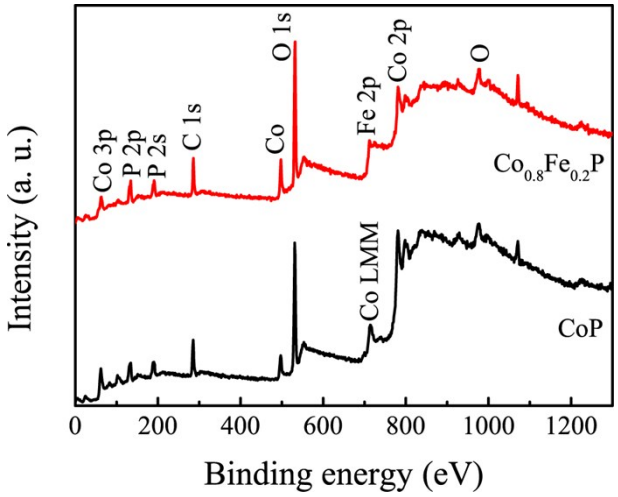

Fig S6 XPS survey scans of CoP and $Co_{0.8}Fe_{0.2}P$ nanosheets.

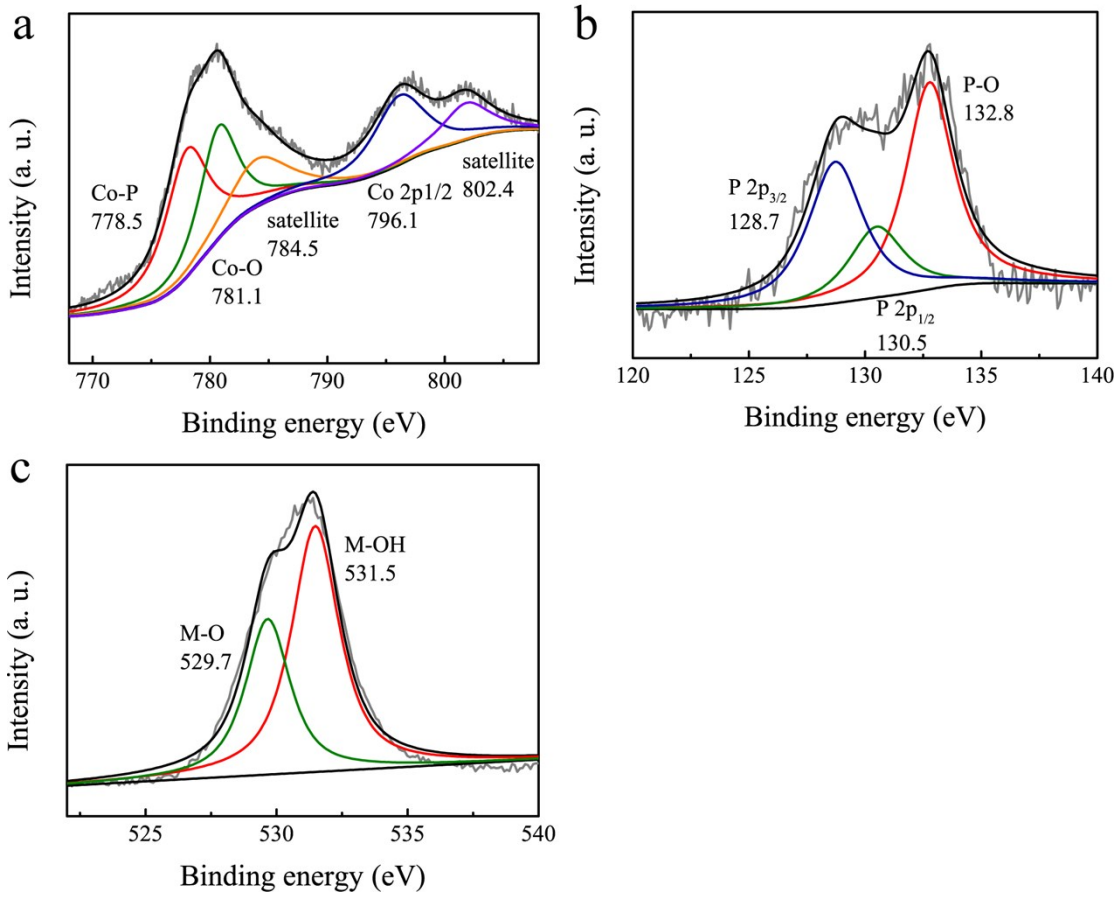

Fig. S7 XPS spectra of CoP nanosheets. (a) Co 2p, (b) P 2p and (c) O 1s.

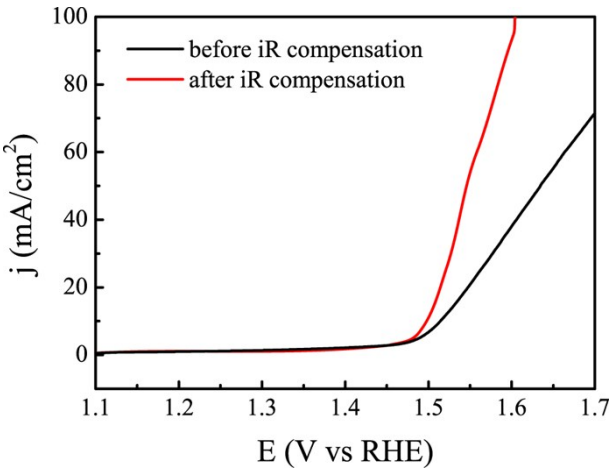

Fig. S8 The LSV curves of $Co_{0.8}Fe_{0.2}P$ nanosheets before and after iR compensation.

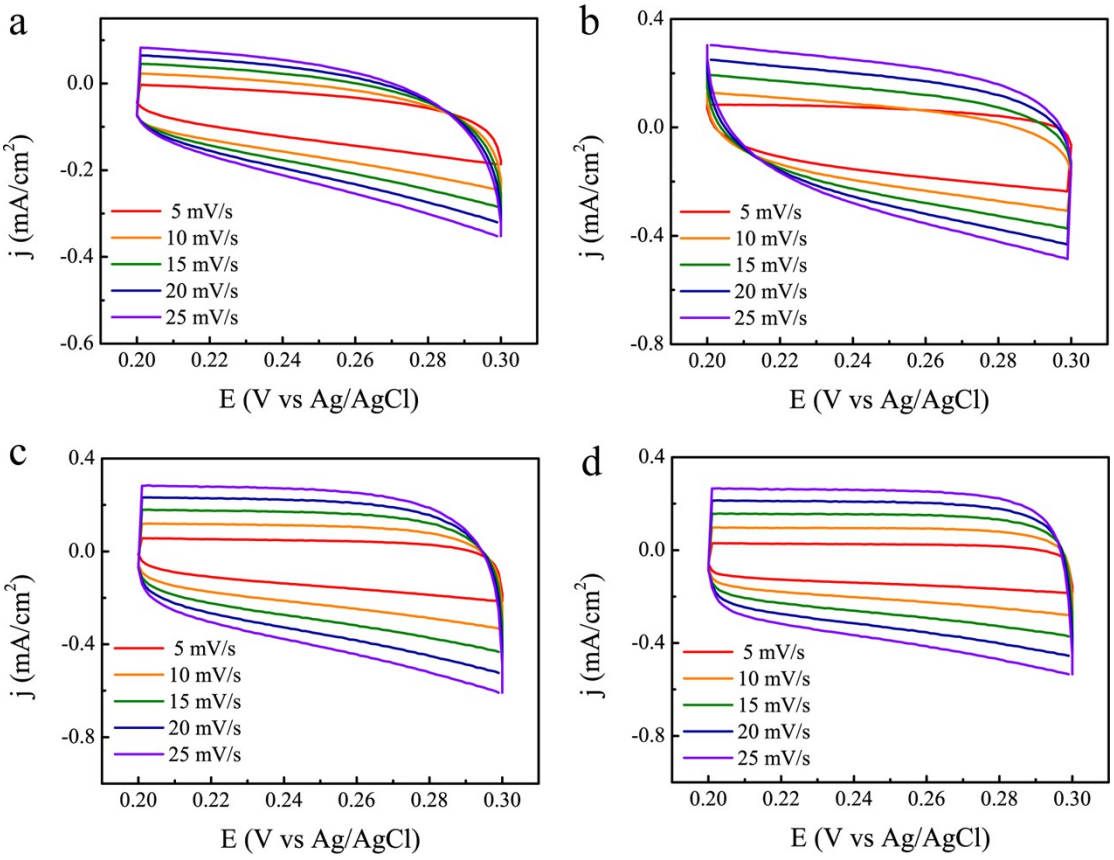

Fig. S9 Cyclic voltammetry of (a) CoP, (b) $Co_{0.9}Fe_{0.1}P$ (c) $Co_{0.8}Fe_{0.2}P$ and (d) $Co_{0.7}Fe_{0.3}P$ nanosheets at different scan rate.

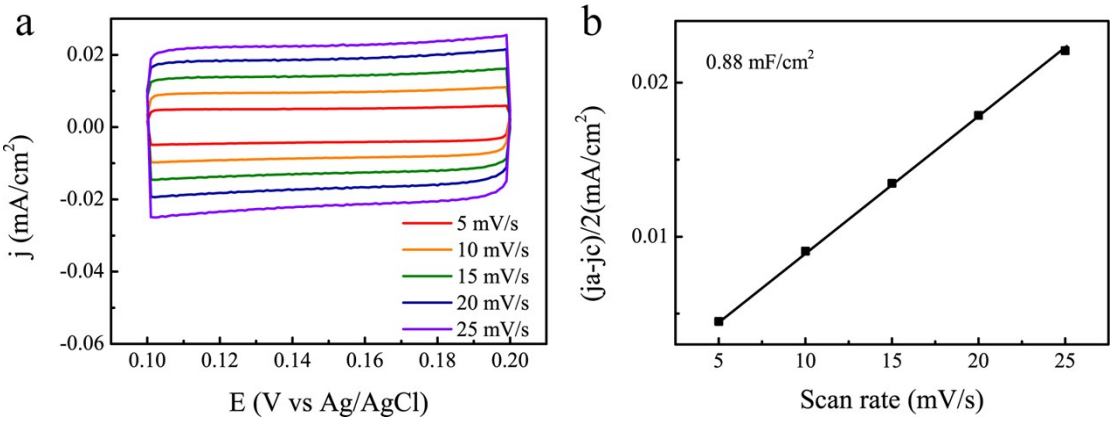

Fig. S10 (a) Cyclic voltammetry of commercial RuO_2. (b) Electrical double-layer capacitance C_{DL} of commercial RuO_2.

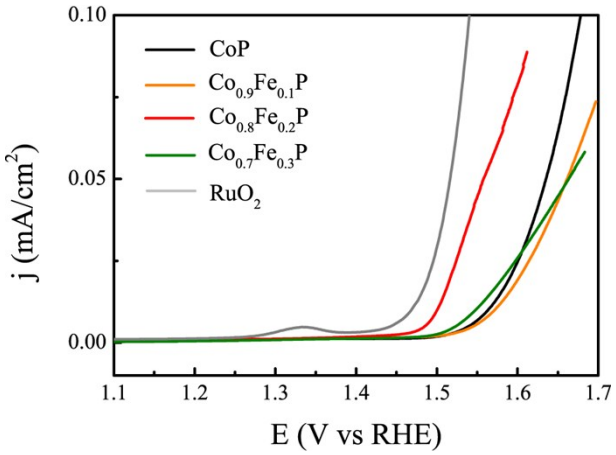

Fig. S11 LSV curves normalised by ECSA.

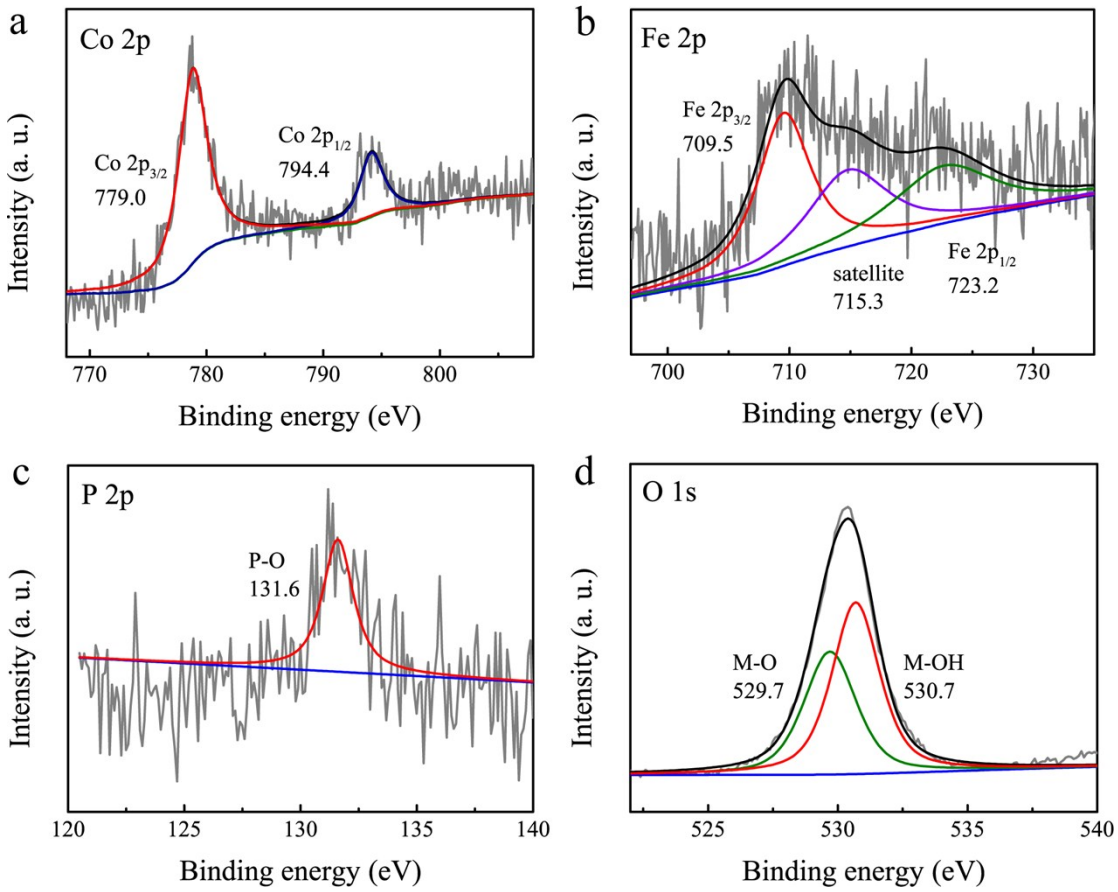

Fig. S12 XPS spectra of $Co_{0.8}Fe_{0.2}P$ nanosheets after OER test. (a) Co 2p, (b) Fe 2p, (c) P 2p and (d) O 1s.

Table S1 Summary of various metal phosphides-based catalysts for OER. The electrolyte in these works are all 1 M KOH, the electrode in these works are all rotating disk electrode (RDE).

Materials	Overpotential (mV) at 10 mA cm^{-2}	Tafel slope ($mV\ dec^{-1}$)	Journal, Year, volume, first page
2D $Co_{0.8}Fe_{0.2}P$ nanosheets	270	50	This work
CoP@S,N-codoped graphite carbon	350	68	Nanoscale, 2018, 10, 14613
defective carbon-	320	52.5	Adv. Energy

CoP			Mater. 2018, 8, 1703623
Co_2P nanocrystals	280	-	Adv. Mater. 2018, 30, 1705796
$Ni_{0.6}Co_{1.4}P$	300	80	Adv. Funct. Mater. 2018, 28, 1706008
$NiCo_2P_x$/CNTs	284	50.3	J. Mater. Chem. A, 2018, 6, 7420
NiCoP/C nanoboxes	330	96	Angew. Chem. 2017, 129, 3955
$Co_{0.9}S_{0.58}P_{0.42}$	266	48	ACS Nano 2017, 11, 11031
Co4Ni1P	245	61	Adv. Funct. Mater. 2017, 27, 1703455
activated Mn-Co oxyphosphide particles	320	52	Angew. Chem. Int. Ed. 2017, 56, 2386