Electronic Supplementary Material (ESI) for Dalton Transactions.

Noble metal free bimetallic phosphide decorated $Zn_{0.5}Cd_{0.5}S$ with efficient photocatalytic H_2 evolution

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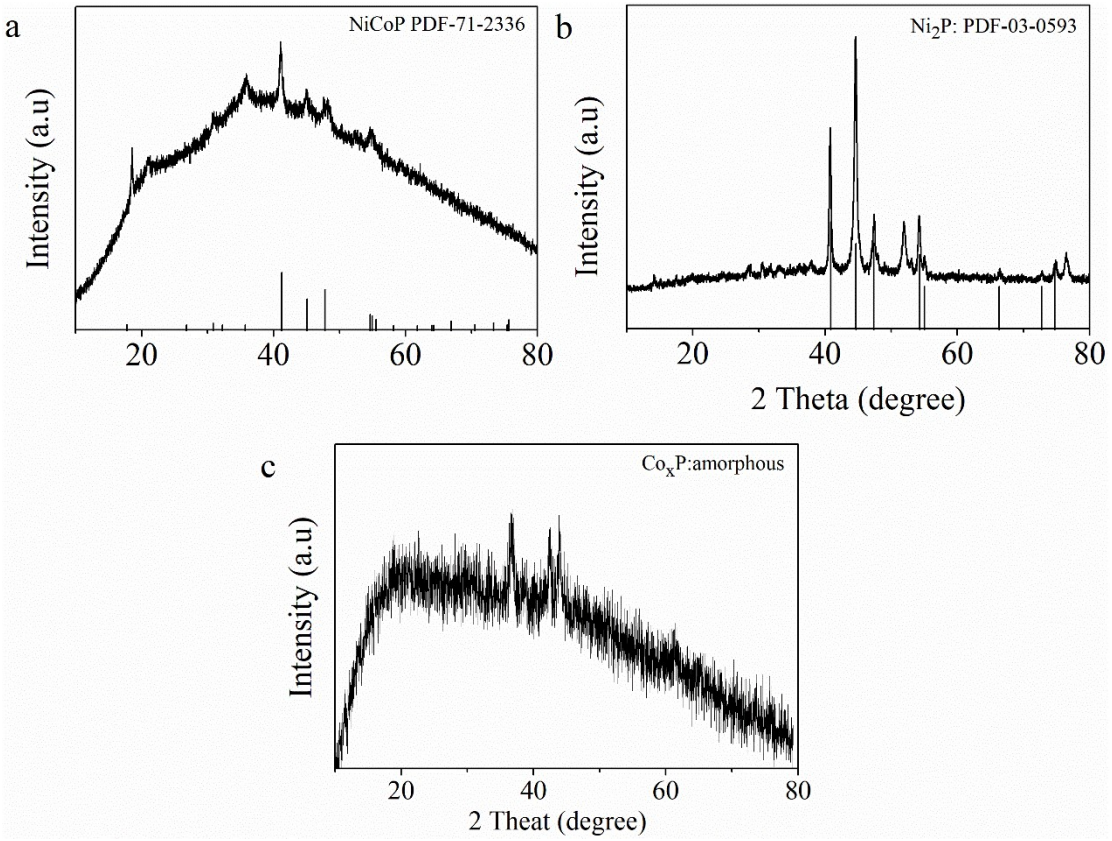

Fig. S1 XRD patterns of NiCoP, Ni_2P and Co_xP.

As shown in Fig. S1 (a, b), the XRD patterns of the NiCoP and Ni_2P nanoparticles exhibits several characteristic diffractions that could be indexed to the of NiCoP and Ni_2P (PDF# 71-2336 and PDF# 03-0953). As depicted in Fig. S1 (c), the amorphous Co_xP was prepared by the same synthesis method.

Table. 1 element amount of 7% NiCoP/$Zn_{0.5}Cd_{0.5}S$

Element	Element content (%)	Element	Element content (%)
Ni	1.88	Zn	21.32
Co	1.48	Cd	20.38
P	1.66	S	38.77

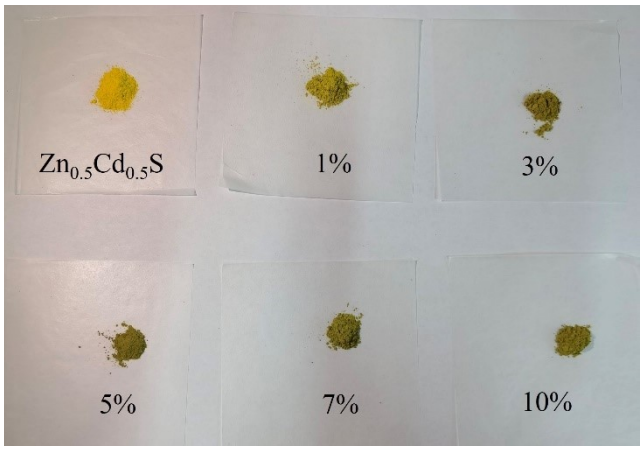

Fig. S2 Digital photographs of the as-prepared samples with different NiCoP loading content

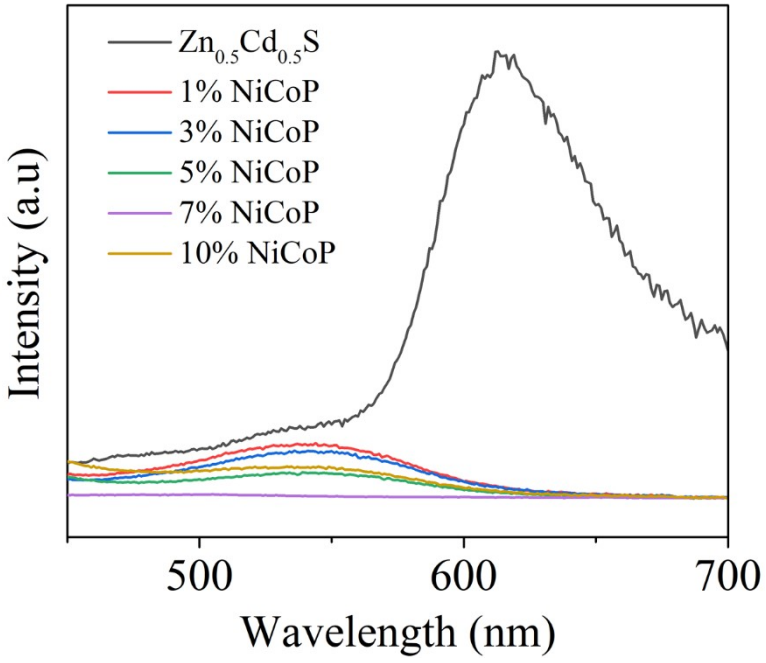

Fig. S3 photoluminescence spectra of $Zn_{0.5}Cd_{0.5}S$ and x *wt*% NiCoP/$Zn_{0.5}Cd_{0.5}S$

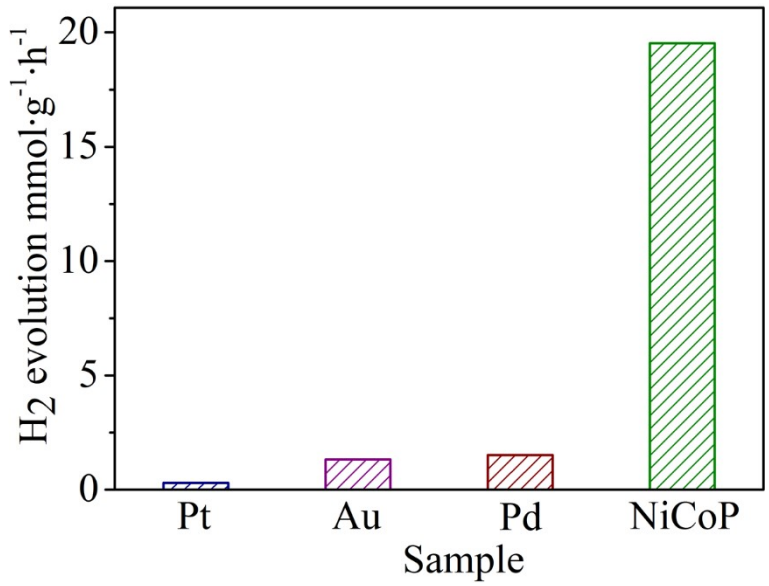

Fig. S4 Photocatalytic H_2 evolution rate of $Zn_{0.5}Cd_{0.5}S$ modified with different cocatalyst.

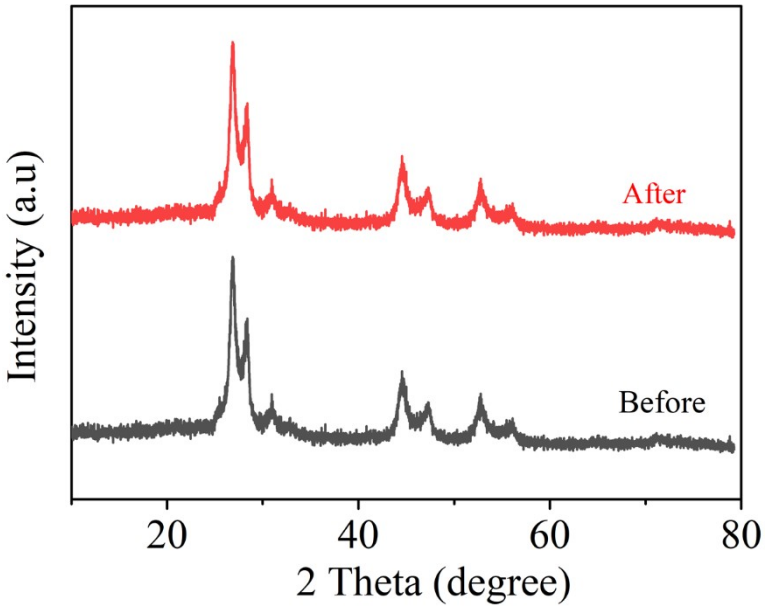

Fig. S5 XRD patterns of 7% NiCoP /$Zn_{0.5}Cd_{0.5}S$ sample before and after H_2 evolution testing.