

Fig. S1. XRD patterns of the NiS/CdS, Ni/CdS and NiS/CdS catalysts, ◆, CdS, ●, NiS.

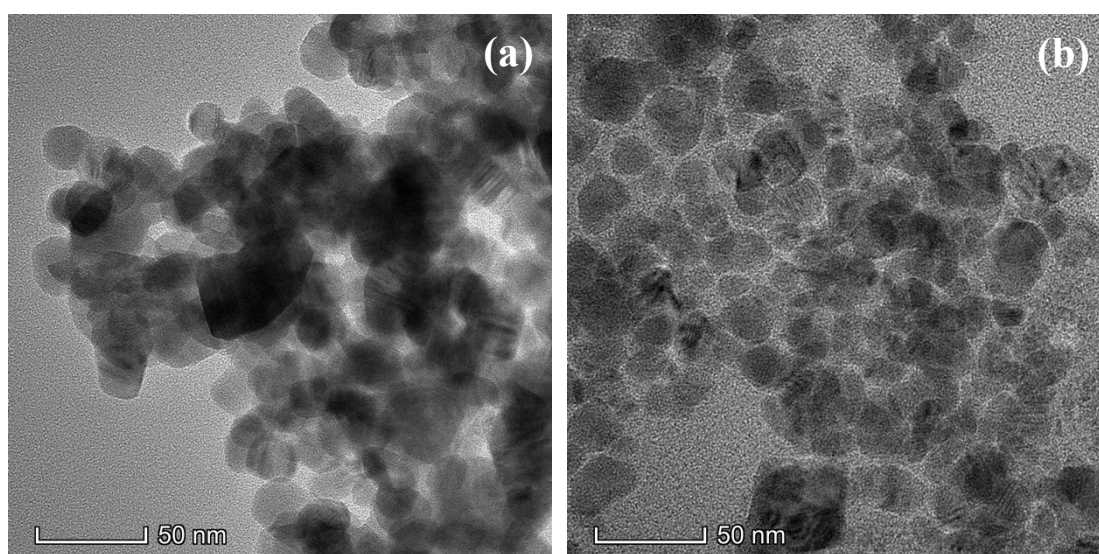


Fig. S2. TEM images of the (a) NiS/CdS and (b) Ni-NiS/CdS-PA catalysts.

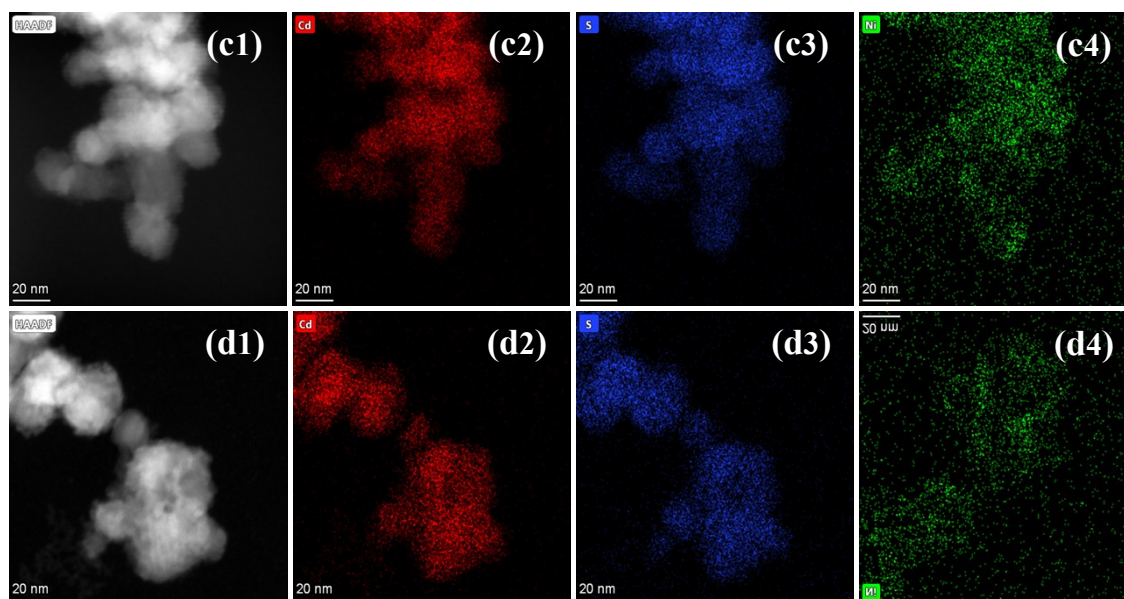


Fig. S3 (c1) HAADF image, (c2) Cd mapping, (c3) S mapping, (c4) Ni mapping of Ni-NiS/CdS-A; (d1) HAADF image, (d2) Cd mapping, (d3) S mapping, (d4) Ni mapping of Ni-NiS/CdS-HA.

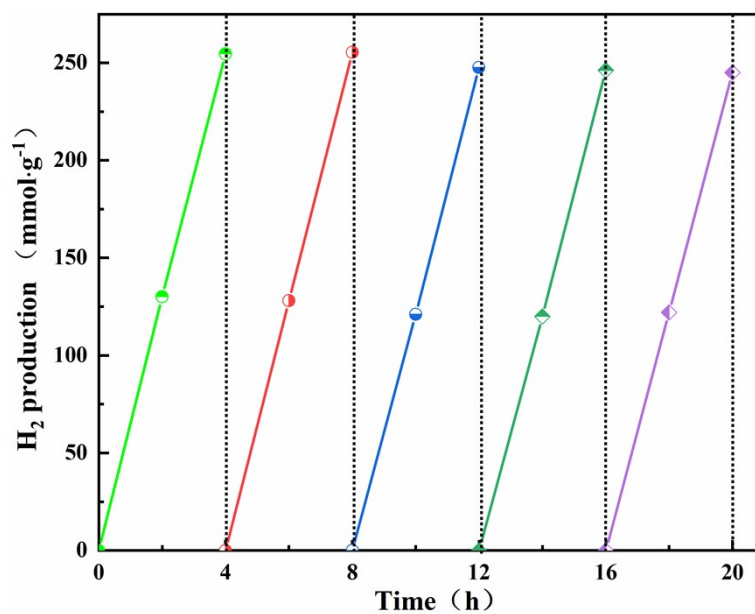


Fig. S4 Stability test of photocatalytic H<sub>2</sub> evolution for Ni-NiS/CdS-PA.

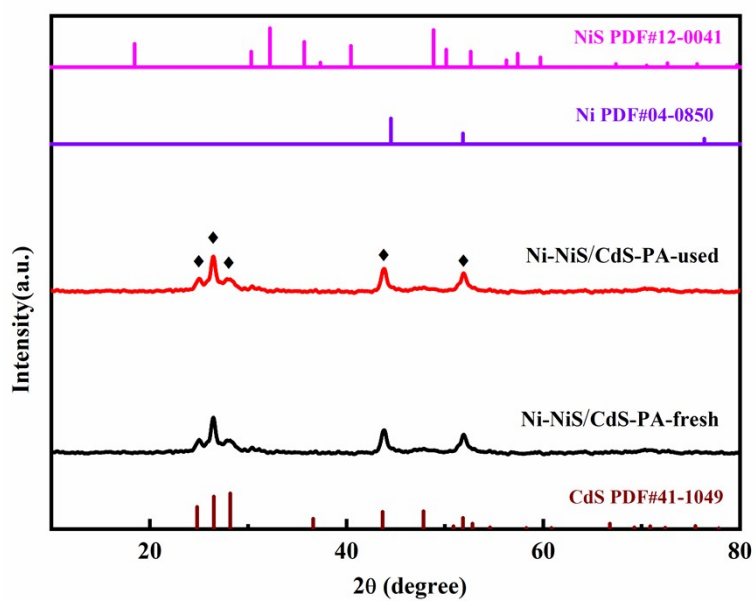


Fig. S5 XRD patterns of the fresh and used Ni-NiS/CdS-PA catalysts.  $\blacklozenge$ , CdS.

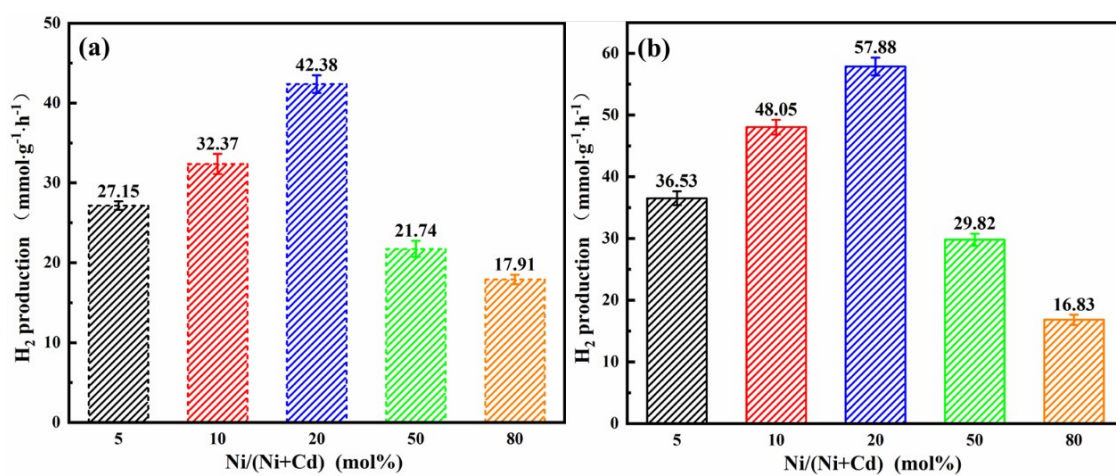


Fig. S6 Photocatalytic H<sub>2</sub> evolution rates bar chart with error bar of (a) Ni-NiS/CdS-A and (b) Ni-NiS/CdS-HA synthesized with different molar ratios of Ni/(Ni+Cd).