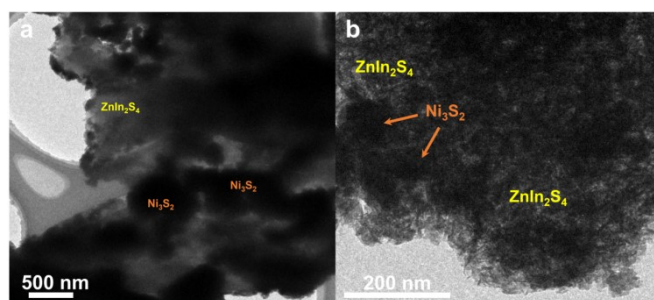# Electronic Supplementary Information

Uniform-embeddable-distributed Ni$_3$S$_2$ cocatalyst inside and outside of sheet-like ZnIn$_2$S$_4$ photocatalyst for boosting photocatalytic hydrogen evolution
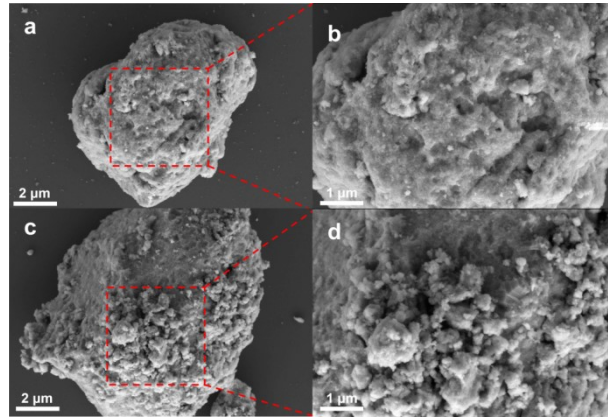
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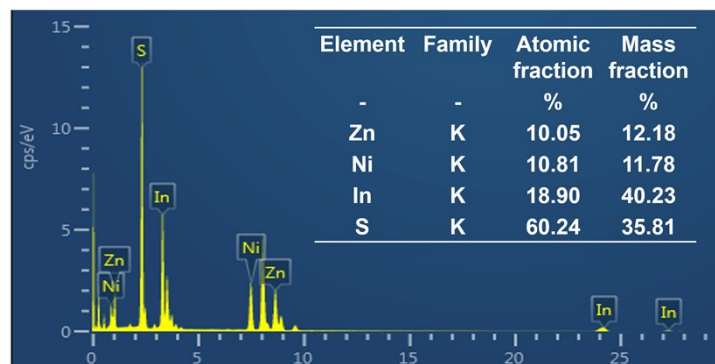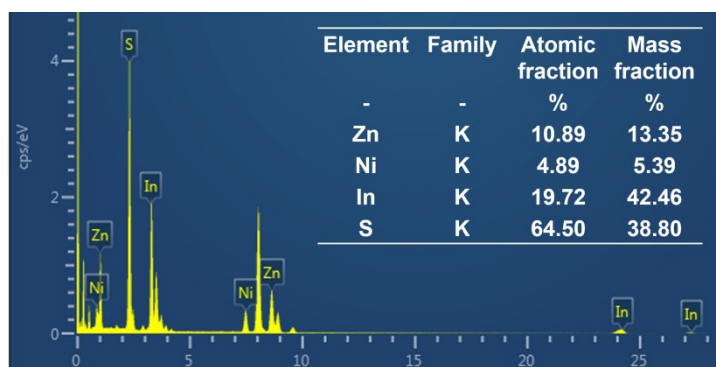
Results

Fig. S1. TEM images of (a) TSLNiS/ZIS and (b) UEDNiS/ZIS.
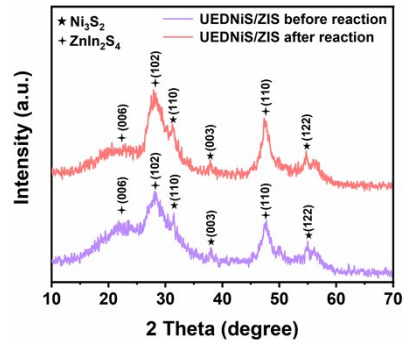
Fig. S2. SEM images of (a, b) TSLNiS/ZIS and (c, d) UEDNiS/ZIS.

Fig. S3. EDX image of TSLNiS/ZIS. The unmarked signal peaks are corresponded to the C and Cu

elements in the carbon-supported copper net used to load the samples in Mapping tests.
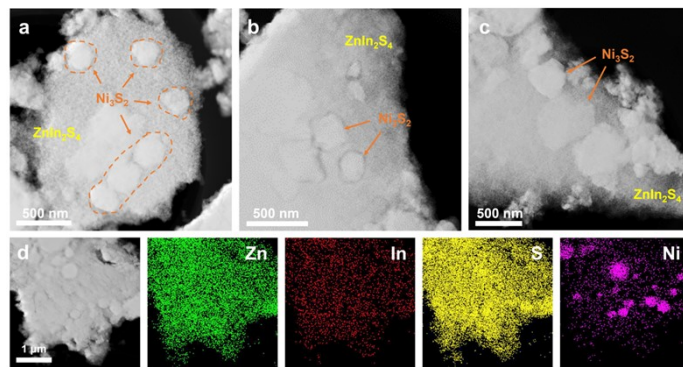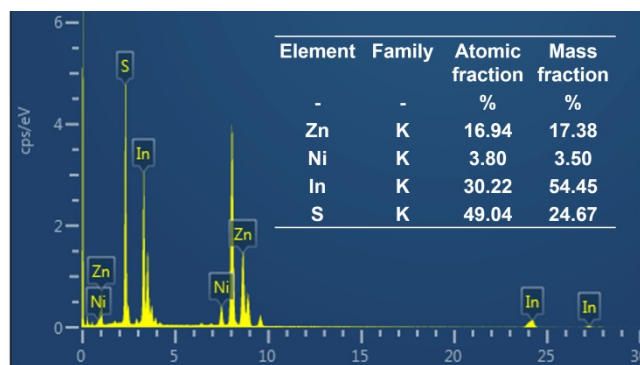
Fig. S4. EDX image of UEDNiS/ZIS. The unmarked signal peaks are corresponded to the C and Cu elements in the carbon-supported copper net used to load the samples in Mapping tests.

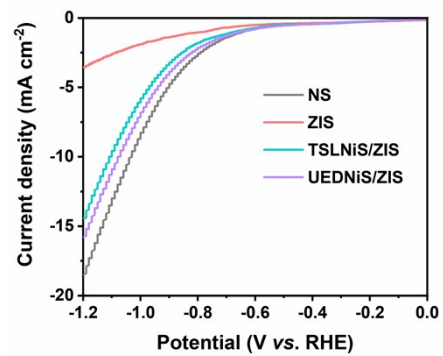**Fig. S5.** XRD patterns of fresh UEDNiS/ZIS and UEDNiS/ZIS after 3 cycling tests.

Fig. S6. (a-c) HAADF-STEM and (d) corresponding elemental mapping images of the recycled UEDNiS/ZIS after 3th photoreactions within 24 h.

Fig. S7. EDX image of the recycled UEDNiS/ZIS. The unmarked signal peaks are corresponded to the C and Cu elements in the carbon-supported copper net used to load the samples in Mapping tests.

Fig. S8. The LSV curves of UEDNiS/ZIS, TSLNiS/ZIS, ZIS and NS.

Table S1. Detailed surface areas and pore volume of UEDNiS/ZIS and TSLNiS/ZIS.

Samples	BET Surface Area (m² g⁻¹)	Pore Volume (cm³ g⁻¹)	Average pore size (nm)
UEDNiS/ZIS	51.58	0.09	4.90
TSLNiS/ZIS	6.28	0.02	5.76