$CdS/Ag_2S/g\text{-}C_3N_4$ ternary composites with superior photocatalytic performance for hydrogen evolution under visible light irradiation

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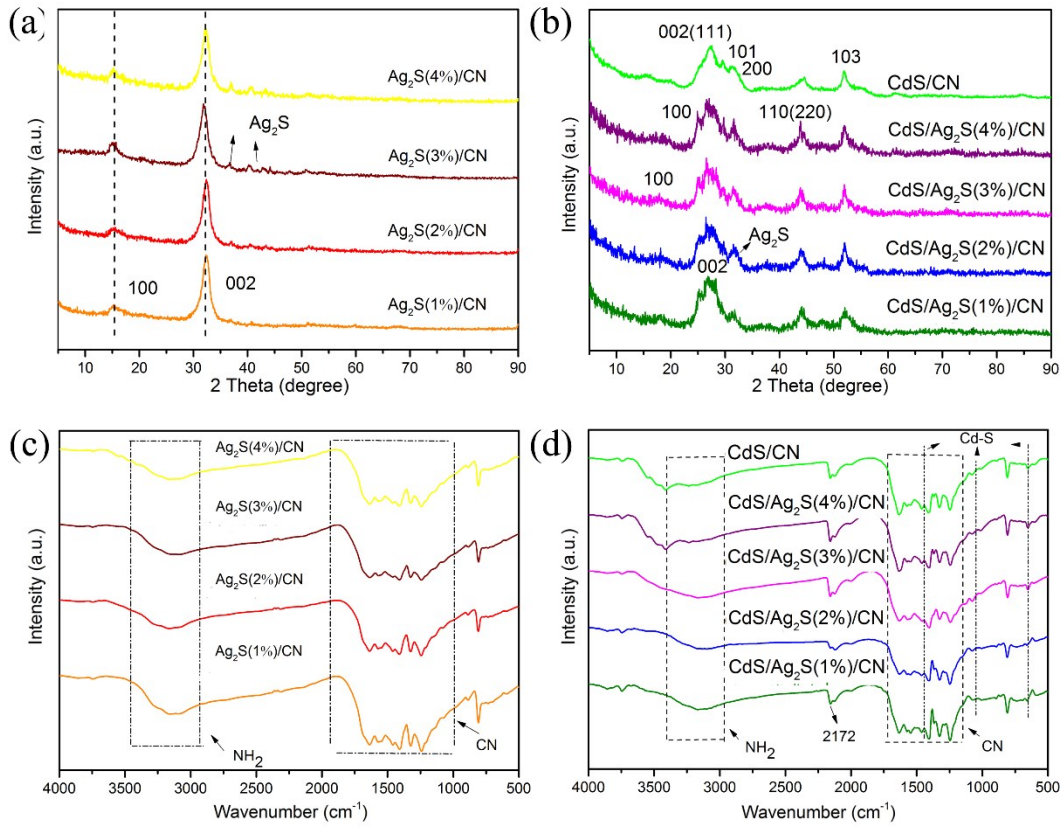

Fig. S1 XRD patterns and FTIR of Ag_2S/CN and CdS/Ag_2S/CN composites

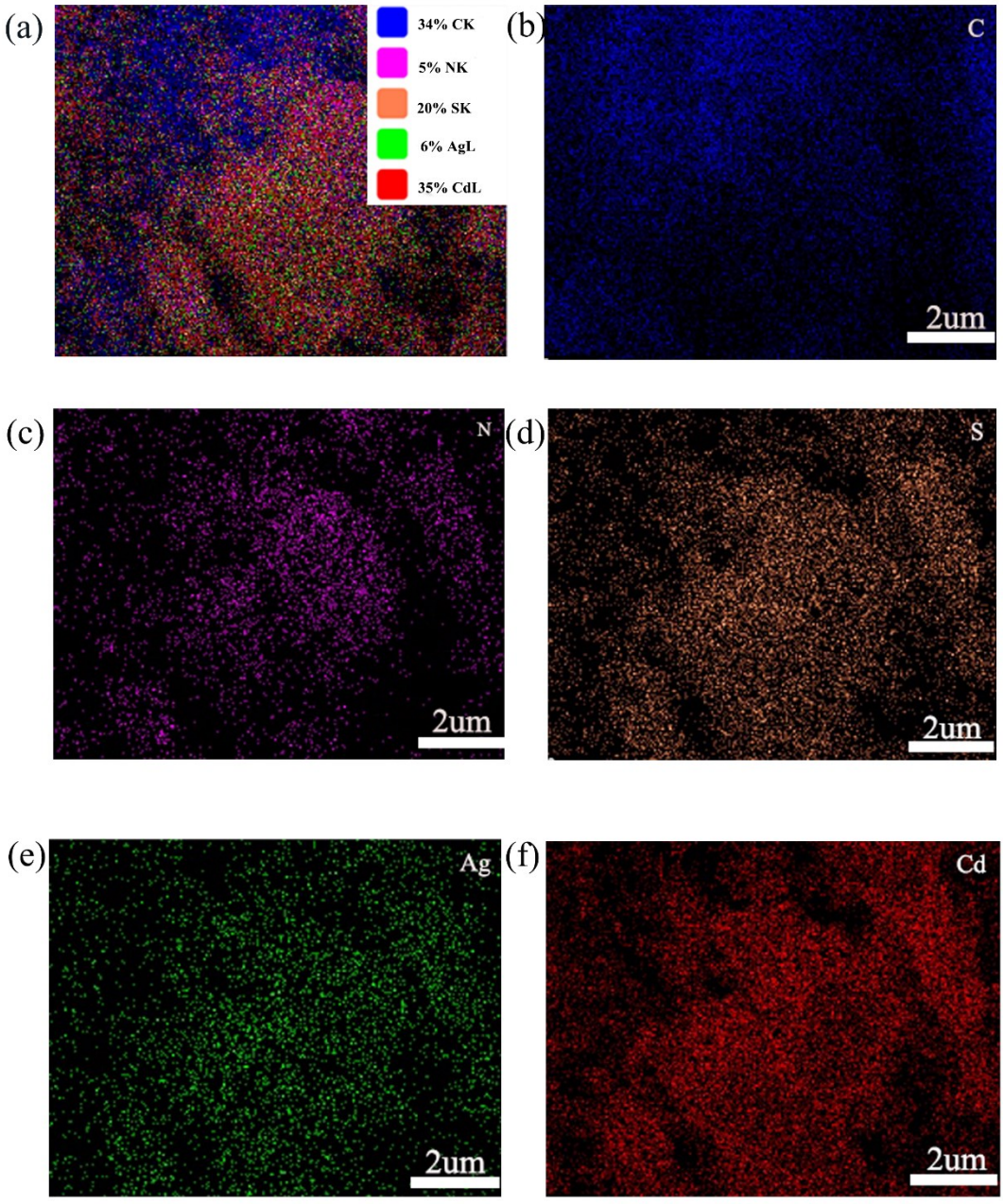

Fig. S2 EDX mapping of CdS/Ag_2S2%/CN composite.

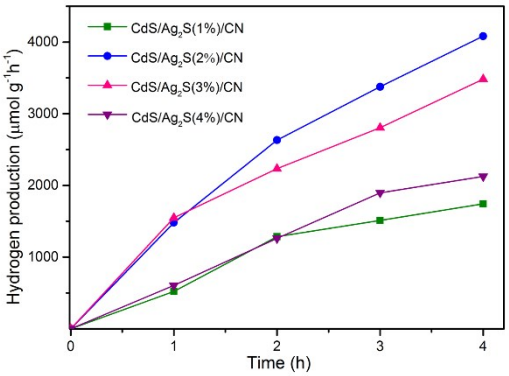

Fig. S3 Photocatalytic hydrogen production activity over $CdS/Ag_2S/CN$ composites.

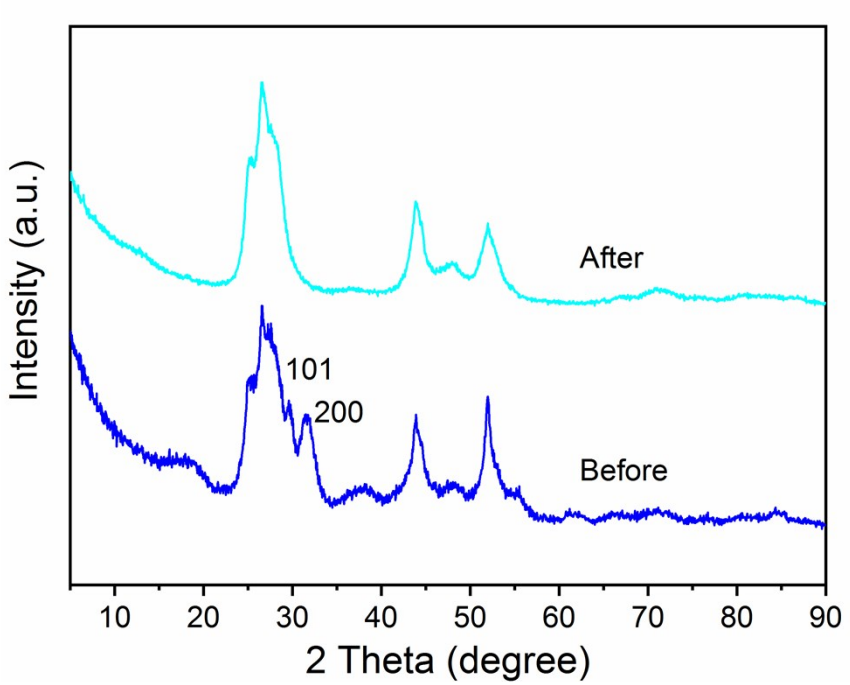

Fig. S4 XRD patterns of $CdS/Ag_2S(2\%)/CN$ ternary composite before and after the stability test.

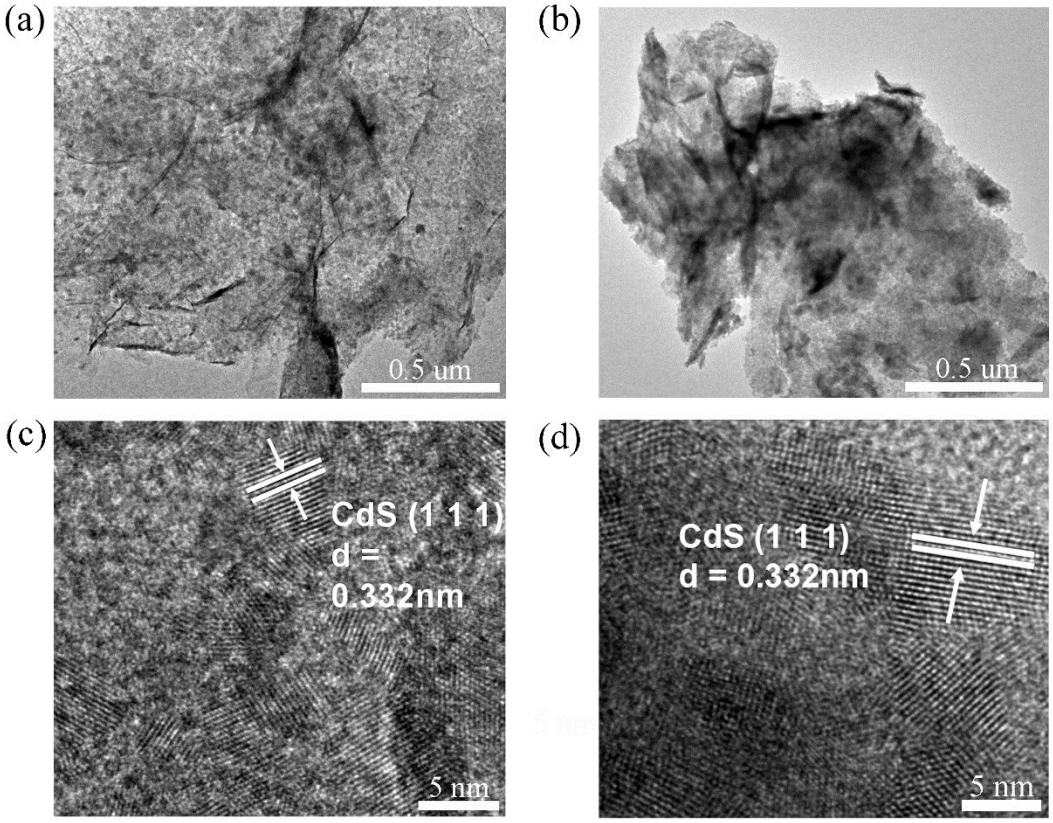

Fig. S5. (a) and (b) TEM images of CdS/Ag_2S2%/CN ternary composite before and after hydrogen evolution reaction, (c) and (d) high-revolution TEM images of ternary composite before and after hydrogen evolution reaction.

Table S1. Comparison of hydrogen production activities of different photocatalysts

Photocatalyst	Co-catalyst	Sacrificial agent	Lamp	Wavelength (nm)	H_2(μmol h^{-1} g^{-1})	Ref.
$MoS_2/Zn_{0.5}Cd_{0.5}S/g\text{-}C_3N_4$	None	$Na_2S\text{-}Na_2SO_3$	300 W Xe	λ ≥400 nm	4914	1
$CdS\text{-}C_3N_4$ nanosheets	H_2PtCl_6	L-ascorbic acid	300 W Xe	λ > 420 nm	4494	2
$CdS/RGO/g\text{-}C_3N_4$	None	L-ascorbic acid	300 W Xe	400 < λ < 800 nm	676.5	3
$CdS/Cu_7S_4/g\text{-}C_3N_4$	None	$Na_2S\text{-}Na_2SO_3$	300 W Xe	λ > 420 nm	3570	4
$CdS/PdAg/g\text{-}C_3N_4$	None	Triethanolamine	300 W Xe	λ ≥400 nm	3098.3	5
$Cd_{0.5}Zn_{0.5}S$@UIO-66@g-C_3N_4	None	$Na_2S\text{-}Na_2SO_3$	300 W Xe	λ ≥420 nm	1281.1	6
$CdS/Ag_2S/g\text{-}C_3N_4$	None	$Na_2S\text{-}Na_2SO_3$	300 W Xe	λ ≥420 nm	1020.54	This work

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