A green and efficient strategy to utilize spent SCR catalyst carrier: in-situ remediation of Cu@TiO_2 for photocatalytic hydrogen evolution

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Table S1 Content of each element in the original SCR catalyst before recycling treatment

	ICP-OES							
element	Ti	Al	Si	W	V	Fe	Ca	-
content	42.49%	2.15%	5.78%	2.21%	0.10%	0.08%	0.77%	-
Corresponding oxides	TiO_2	Al_2O_3	SiO_2	WO_3	V_2O_5	Fe_2O_3	CaO	Other
content	70.92%	8.12%	12.40%	2.79%	0.36%	0.23%	1.08%	4.10%

Table S2 Elemental content of spent SCR catalysts after recycling treatment

	ICP-OES							
element	Ti	Al	Si	W	V	Fe	Ca	-
content	57.55%	0.96%	0.14%	0.25%	0.05%	0.06%	0.06%	-
Corresponding oxides	TiO_2	Al_2O_3	SiO_2	WO_3	V_2O_5	Fe_2O_3	CaO	Other
content	96.07%	3.61%	0.30%	0.31%	0.19%	0.18%	0.09%	-

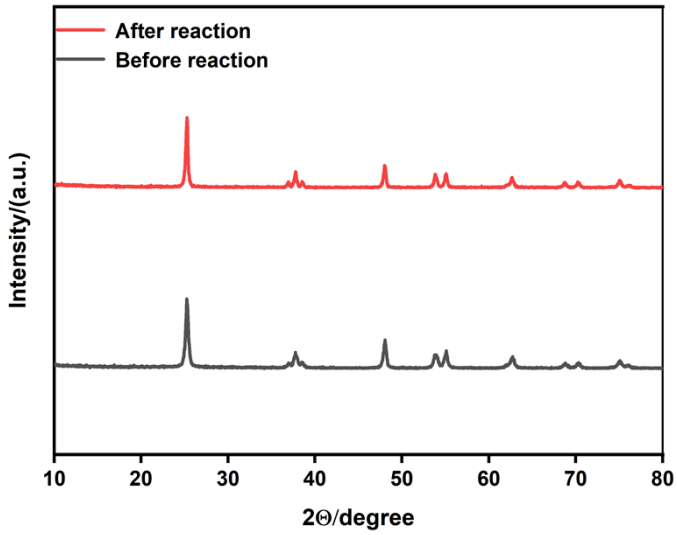

Fig. S1. XRD comparison of samples before and after photocatalytic hydrogen production reaction

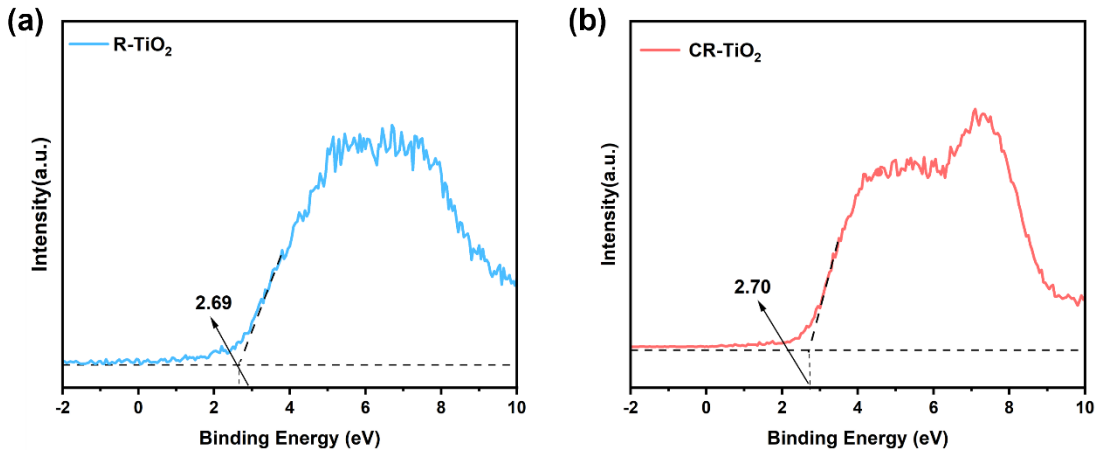

Fig. S2. XPS valence-band spectra of TiO_2, (b) and Cu–TiO_2

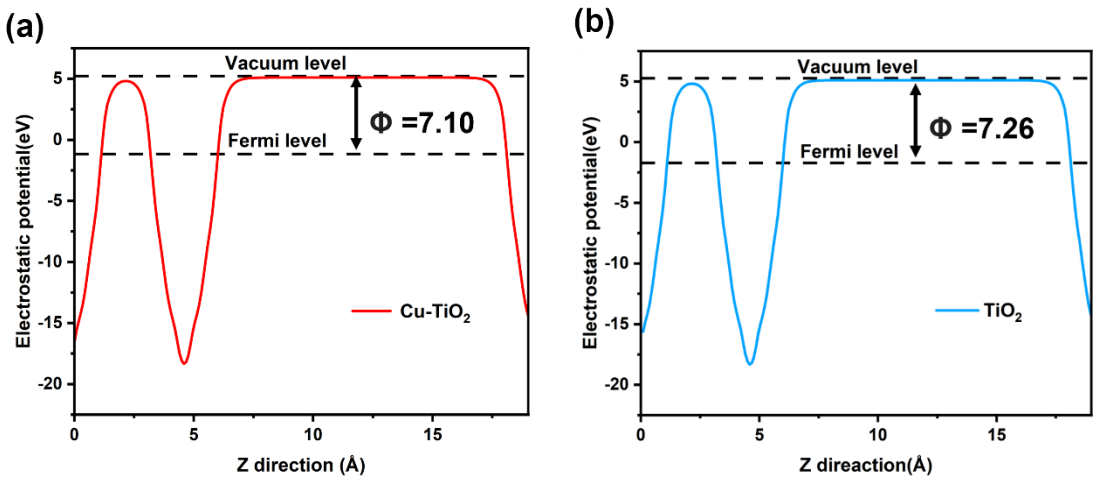

Fig. S3. Workfunction of Cu-TiO_2 and TiO_2

Table S3 Content of different types of oxygen in XPS analysis.

catalyst	O1	O2	O3
Cu-TiO_2	79.98%	14.26%	5.76 %
TiO_2	81.40%	8.29 %	10.31%

Table S4. A comparison of g-C_3N_4-based photocatalysts for hydrogen production.

Photocatalysts	Light sources	Sacrificial agents	HER rates (μmol h^{-1} g^{-1})	Refs.
Cu-TiO_2 (Recovery)	300 W Xe lamp	20% (vol.) TEOA solution	368	**This work**
Ni-7.5@TCN	300 W Xe lamp $\lambda > 365$ nm	10% (vol.) TEOA	134	[1]
Pt@N-g-C_3N_4	300 W Xe lamp $\lambda > 420$ nm	10% (vol.) TEOA	64	[2]
Pt/$AgNbO_3$/g-C_3N_4	300 W Xe lamp $\lambda > 420$ nm	20 % (vol.) CH_3OH	88	[3]
TiO_2/g-C_3N_4	420 W Xe lamp $\lambda > 300$ nm	10 % (vol.) CH_3OH	36.4	[4]
NiO/g-C_3N_4	420 W Xe lamp $\lambda > 365$ nm	10% (vol.) TEOA	68.8	[5]
Pt/t-ZrO_2/g-C_3N_4	300 W Xe lamp $\lambda > 420$ nm	10% (vol.) TEOA	261	[6]
$Cd_xZn_{1-x}S$/Au/g-C_3N_4	300 W Xe lamp $\lambda > 420$ nm	0.1 mol L^{-1} glucose	123.2	[7]
WS_2/g-C_3N_4	300 W Xe lamp	20% (vol.) TEOA	154	[8]

Reference

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