

Supporting Information
for

Three-Dimensional Graphene Oxide Cross-Linked by Benzidine as an Efficient Metal-free Photocatalyst for Hydrogen Evolution

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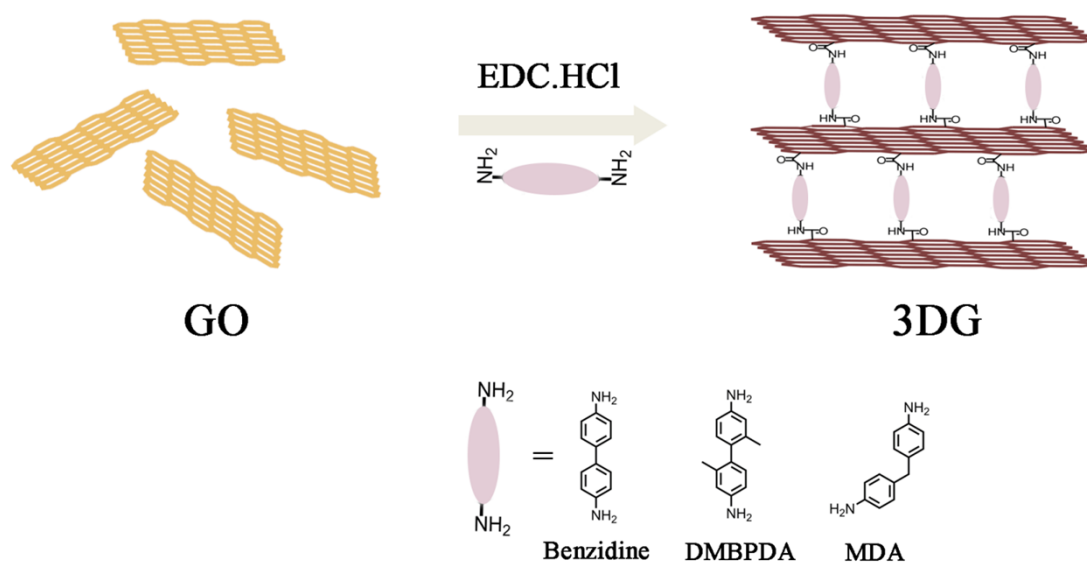


Fig. S1 Preparation scheme of the 3DG materials with benzidine, DMBPDA, and MDA as the cross-linker.

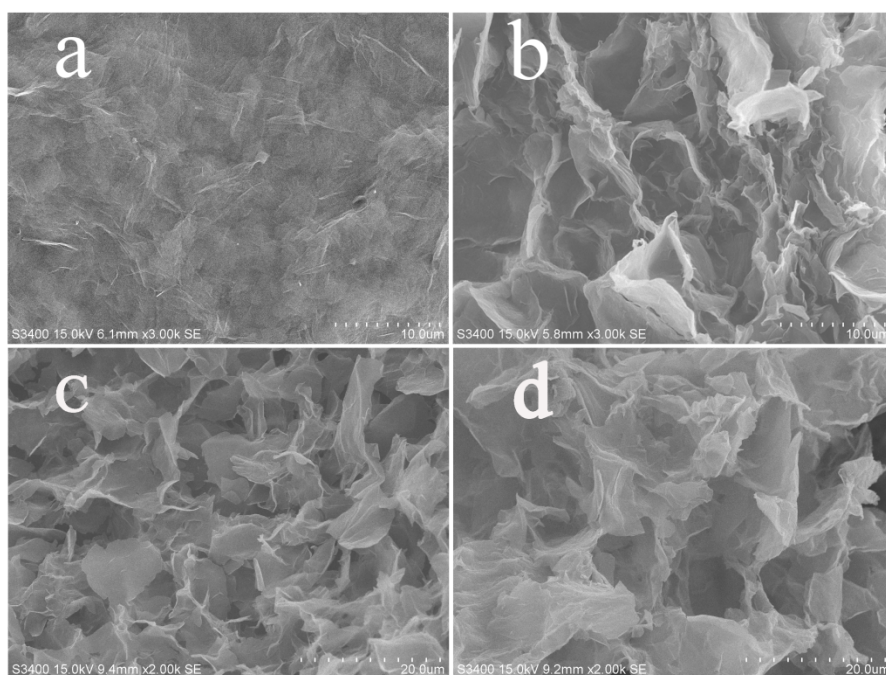


Fig.S2 SEM images of (a) GO, (b) GO-Benzidine (3DG-1), (c) GO-DMBPDA, (d) GO-MDA.

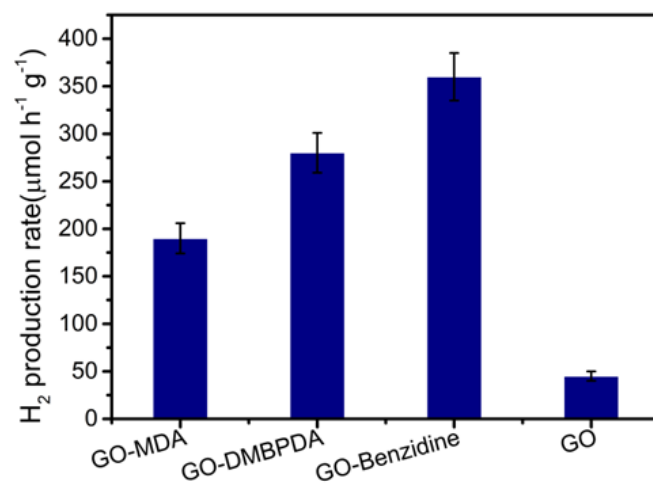


Fig.S3 Photocatalytic activity for H₂ production of GO-MDA, GO-DMBPDA, GO-Benzidine(3DG-1) and GO.

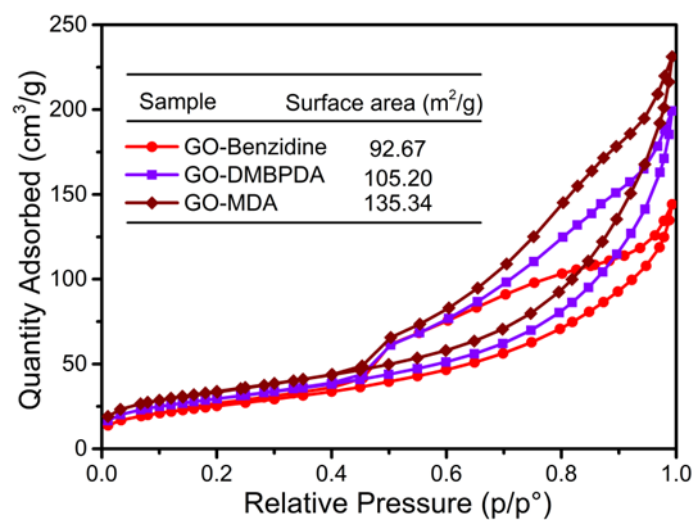


Fig.S4 N₂ adsorption-desorption isotherms of GO-MDA, GO-DMBPDA and GO-Benzidine(3DG-1).

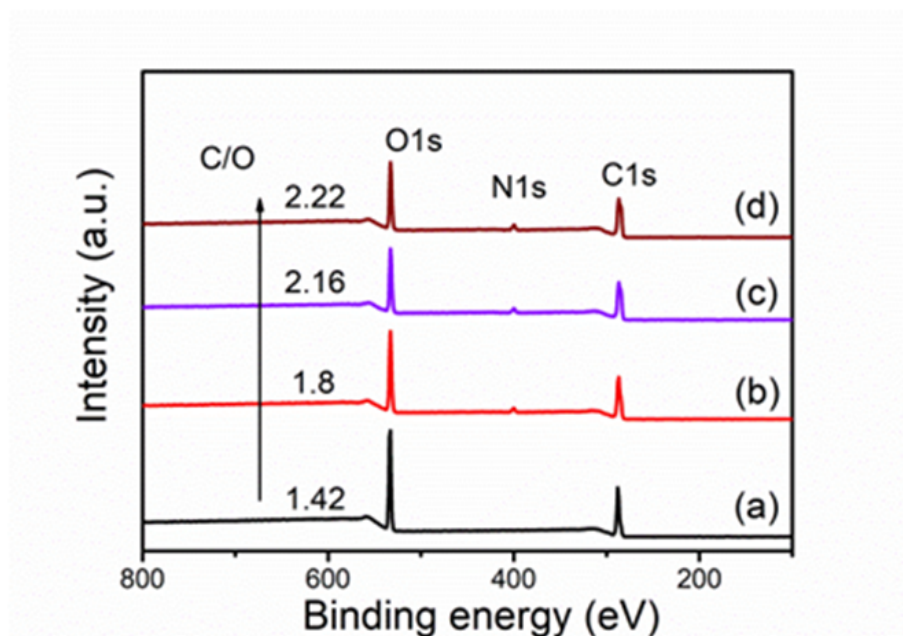


Fig.S5 The full XPS spectra of (a)GO, (b) GO-Benzidine(3DG-1), (c) GO-DMBPDA and (d) GO-MDA.

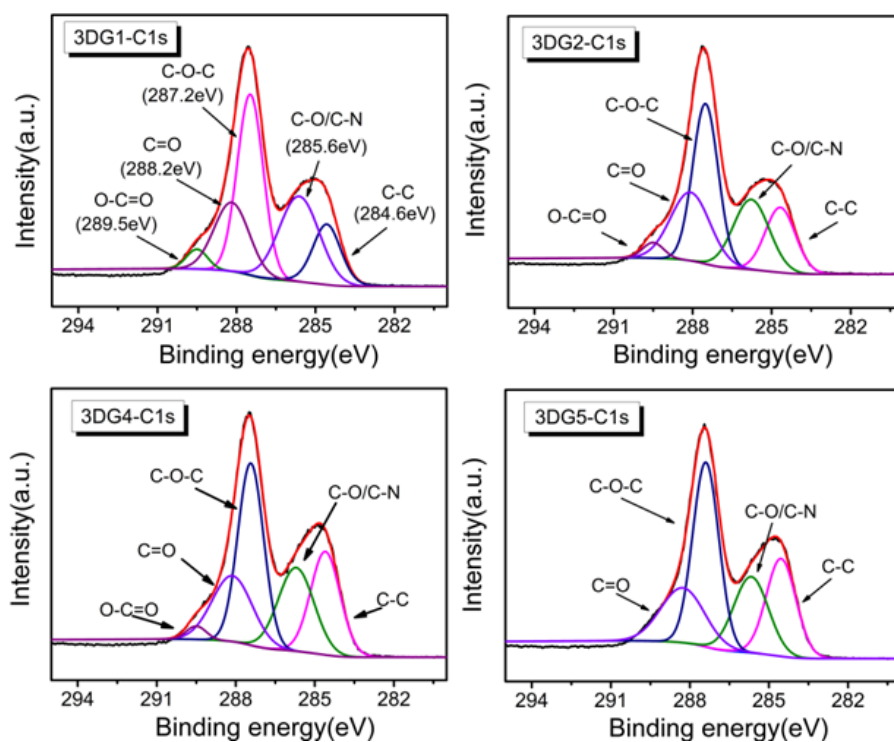


Fig. S6 C1s XPS spectrums of 3DG-1, 3DG-2, 3DG-4 and 3DG-5.

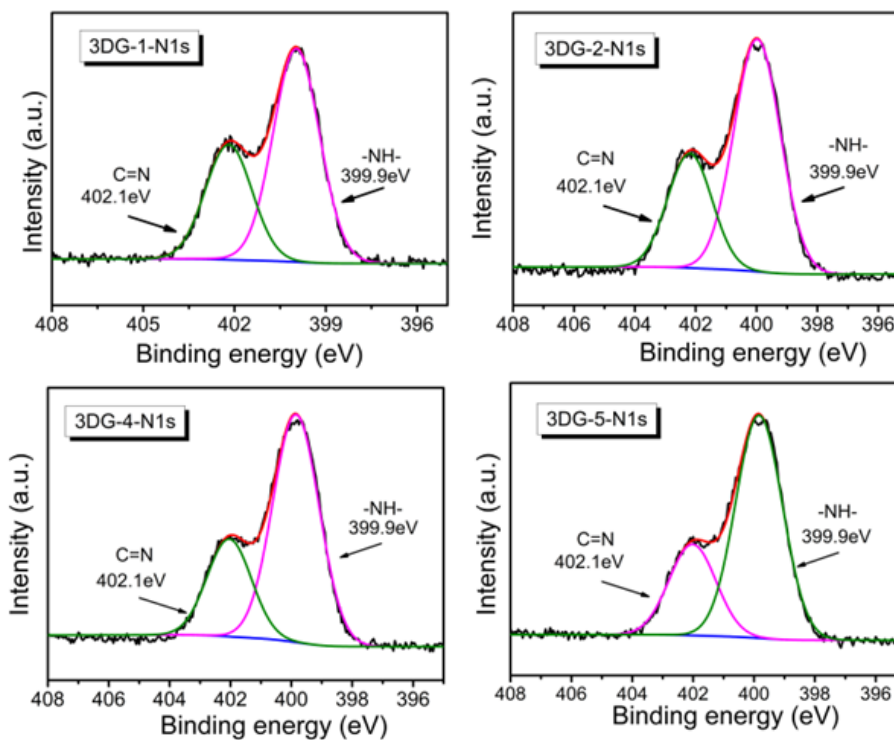


Fig. S7 N1s XPS spectra of 3DG-1, 3DG-2, 3DG-4 and 3DG-5.

Table S1 Metal-free photocatalysts for H₂ production

Photocatalyst	H ₂ evolved ($\mu\text{molg}^{-1}\text{h}^{-1}$)	Sacrificial agents	Light source (W)	λ	Ref.
3DG-3	690	TEOA	Xe lamp (300)	320–780 nm	This work
3DG-650	270	EtOH	Xe lamp (200)	320–780 nm	S1
GO-0.47	1104	Na ₂ S/Na ₂ SO ₃	Xe lamp (500)	320–780 nm	S2
3D N-doped g-C ₃ N ₄	480	HL	Xe lamp (300)	> 420 nm	S3
g-C ₃ N ₄ /B-rGO	273	TEOA	Xe lamp (500)	simulate sunligh	S4
C-I codoped g- C ₃ N ₄	168	TEOA	Xe lamp (300)	> 400 nm	S5
C ₃ N ₄ (1.0 wt% Pt)	772	TEOA	Xe lamp (350)	> 420 nm	S6
g-C ₃ N ₄ @C	16885	TEOA	Xe lamp (500)	> 420 nm	S7
g-C ₃ N ₄ (3 wt% Pt)	459	HL	Xe lamp (300)	> 400 nm	S8

References:

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