Supporting Information

g-C_3N_4/$Ti_3C_2T_x$(MXenes) Composite with Oxidized Surface Groups for Efficient Photocatalytic Hydrogen Evolution

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The images of HRTEM of the composite were showed in supporting information. The HER of different ratios and annealing method between g-C_3N_4 and Ti_3C_2 and ΔGH (eV) of different terminated Ti_3C_2 were also demonstrated.

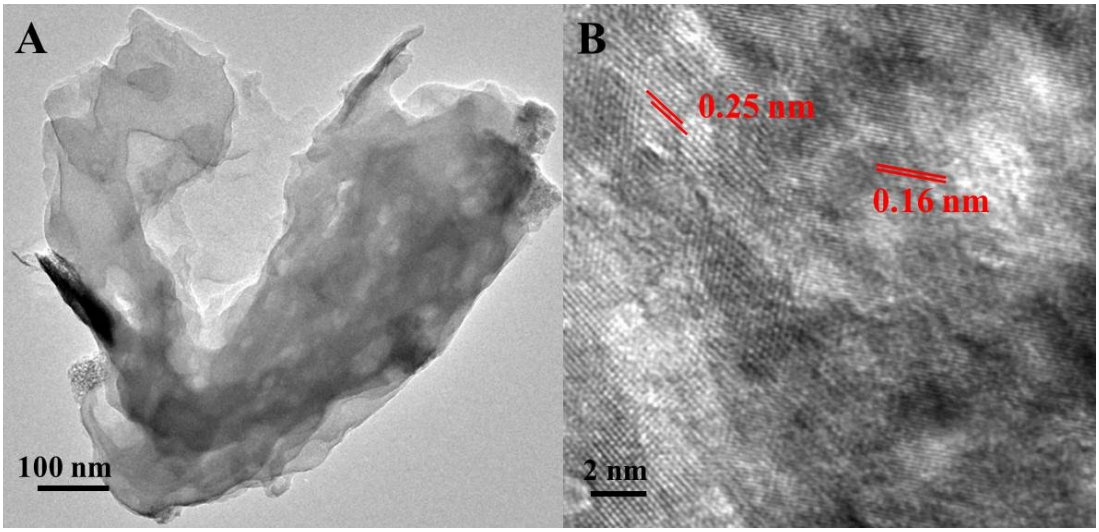


Figure S1. The HRTEM image of g-C_3N_4 with 30% Ti_3C_2 annealed in air for A) low and B) high magnification.

Figure S1 showed the HRTEM image of the hybrid. The interface between g-C_3N_4 and Ti_3C_2 could be observed obviously.

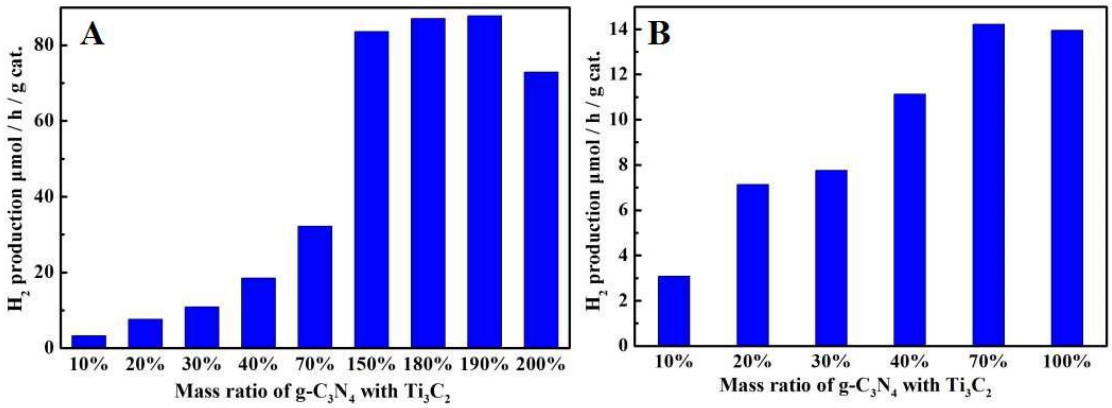


Figure S2. The HER of A) g-C_3N_4 with Ti_3C_2 annealed in N_2 and B) g-C_3N_4 with Ti_3C_2 annealed in air at different ratios.

As shown in Figure S2, the mass ratio of g-C_3N_4 with Ti_3C_2 at 190% annealed in air demonstrated the best performance for hydrogen evolution while that at 70% annealed in N_2 did.

In Figure S3, g-C_3N_4 with 3% Pt as cocatalyst demonstrated the best H_2 production, which achieved 56.2 μmol/h/g.cat and lower than that of g-C_3N_4 with 190% Ti_3C_2 annealed in air.

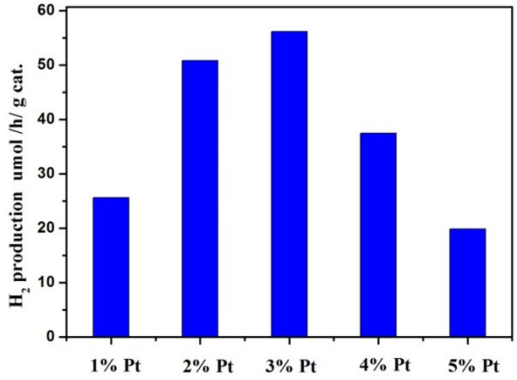


Figure S3. The HER of g-C_3N_4 with Pt at different ratios.

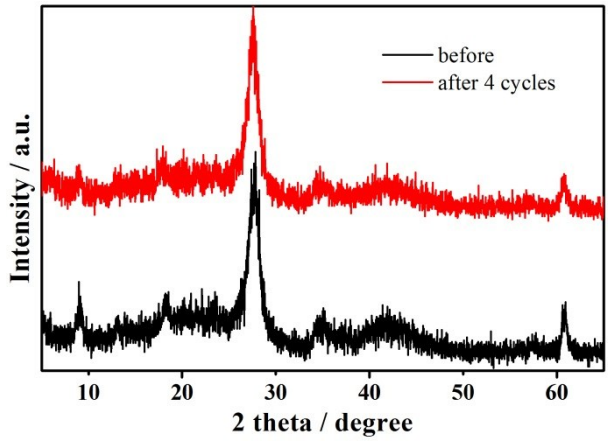
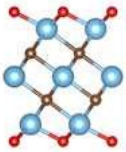
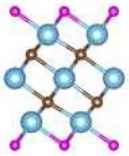


Figure S4. The XRD spectra of g-C_3N_4 with 30% Ti_3C_2 annealed in air before and after 4 cycles.

Though the separation of g-C_3N_4 and Ti_3C_2 after tests, no obvious differences were shown between the XRD spectra of g-C_3N_4 with 30% Ti_3C_2 annealed in air before and after 4 cycles.

Table S1 displayed the ΔG_H of Ti_3C_2 with different termination groups. ΔG_H of -F terminations were much higher than that of -O, thus -O terminations showed a better photocatalysis activity of hydrogen evolution.

Table S1. ΔGH (eV) of different terminated Ti_3C_2 with different atomic H coverage

System	structure	Site	θ_H(ML)	ΔG_H(eV)
Bare		-	25%	-0.659
			50%	-0.626
O-Ti_3C_2		c	**25%**	**0.011**
			50%	0.285
F-Ti_3C_2		c	25%	2.740
			50%	3.705