Electronic Supplementary Material (ESI) for Nanoscale.

Plasma-modified $Ti_3C_2T_x$/CdS hybrids with oxygen-containing groups for high-efficiency photocatalytic hydrogen production

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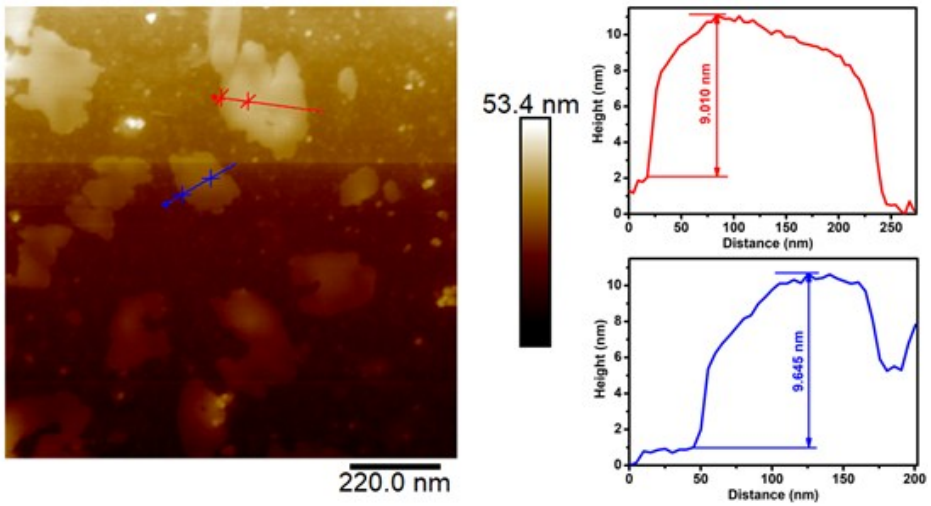

Fig. S1 Atomic force microscopy (AFM) image and corresponding height profiles along the red and blue lines of NPT.

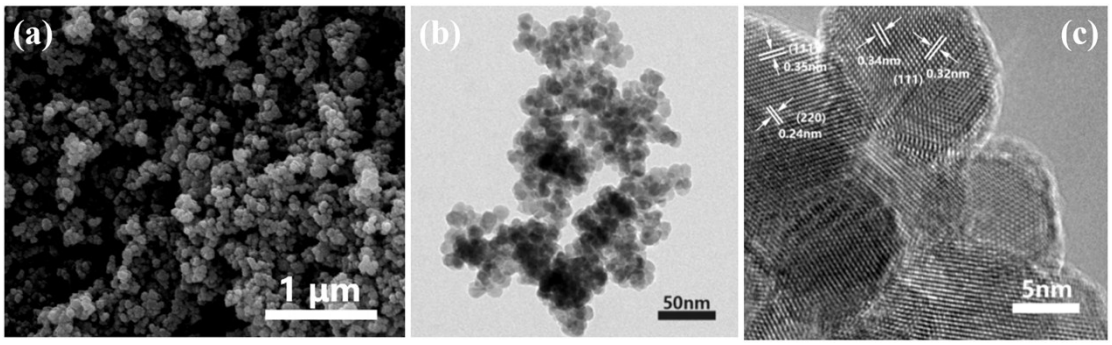

Fig. S2 (a) SEM, (b) TEM and (c) HRTEM images of as-prepared pure CdS (CT0).

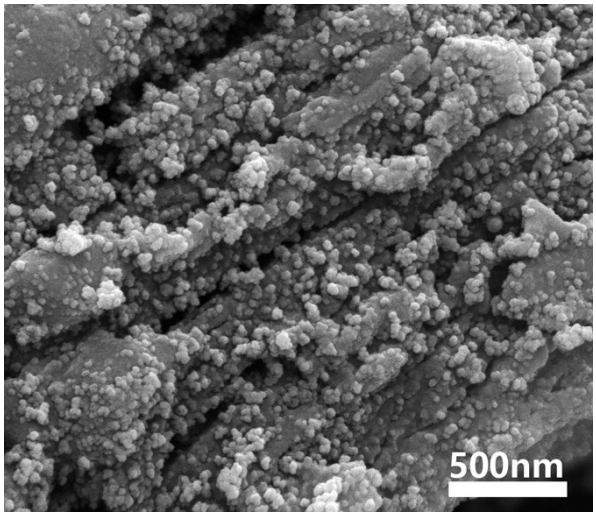

Fig. S3 SEM image of the mixture of 1 wt.% non-plasma treated Ti_3C_2 and 99 wt.% CdS NPs (NPCT1).

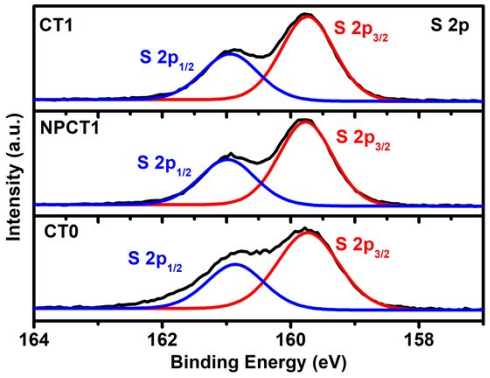

Fig. S4 The high-resolution XPS spectra of S 2p for CT0 (CdS NPs), CT1 (CT hybrid with 1 wt.% $Ti_3C_2T_x$) and NPCT1 (CT hybrid with 1 wt.% Ti_3C_2).

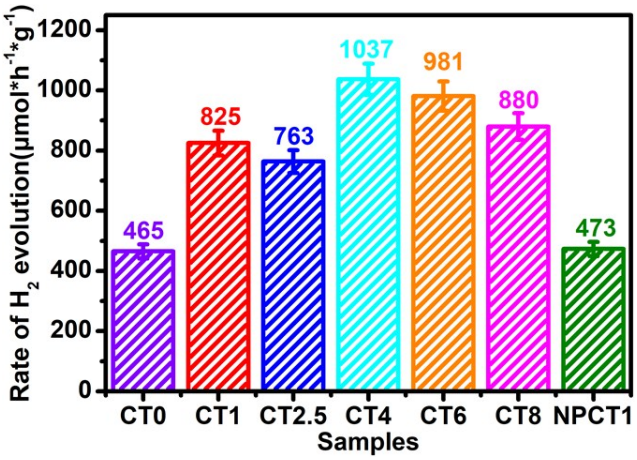

Fig. S5 Photocatalytic H_2-production of as-prepared CTx (x=0, 1, 2.5, 4, 6, 8; CTx: CT hybrids with a $Ti_3C_2T_x$ content of x wt.%) and NPCT1 (CT hybrid with 1 wt.% Ti_3C_2) under visible-light irradiation.

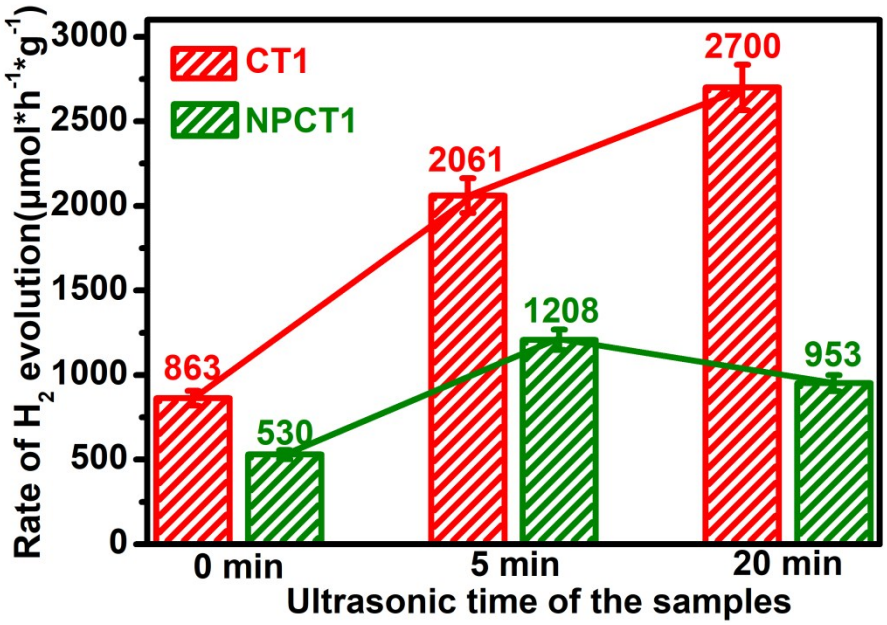

Fig. S6 After different ultrasonic pretreatment time, the H_2 evolution yield of CT1 and NPCT1 under visible-light irradiation.

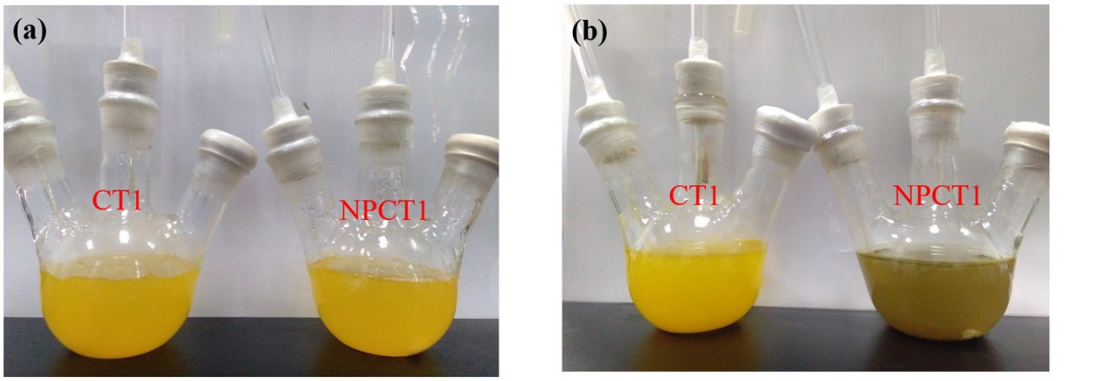

Fig. S7 CT1 and NPCT1 reaction solution before sonication and visible-light irradiation (a) and after 20 min of sonication + 3 h of visible light irradiation (b).

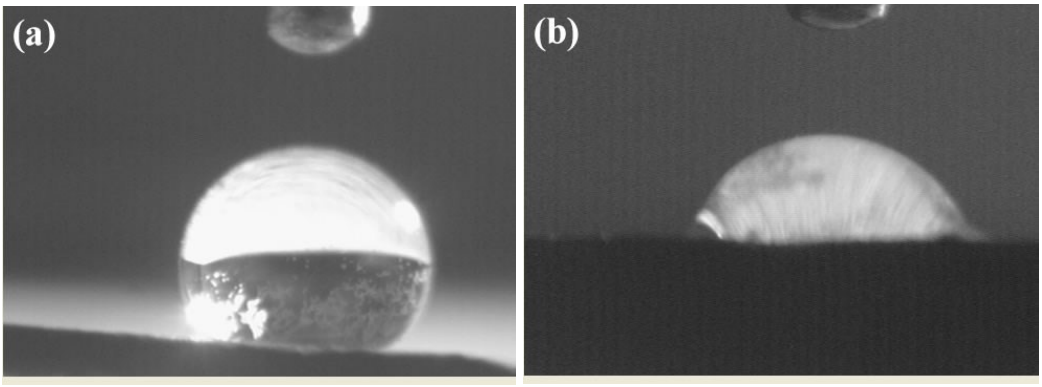

Fig. S8 Contact angle measurements of (a) non-plasma-treated Ti_3C_2 and (b) plasma-modified $Ti_3C_2T_x$. The static contact angle measurements show that the contact angle of plasma-modified $Ti_3C_2T_x$ is dramatically decreased comparing with the non-plasma-treated Ti_3C_2, suggesting the hydrophilicity of plasma-modified $Ti_3C_2T_x$ after plasma treatment.