Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Electronic Supplementary Information

Hierarchical composites of TiO_2 nanowire arrays on reduced graphene oxide nanosheets with enhanced photocatalytic hydrogen evolution performance

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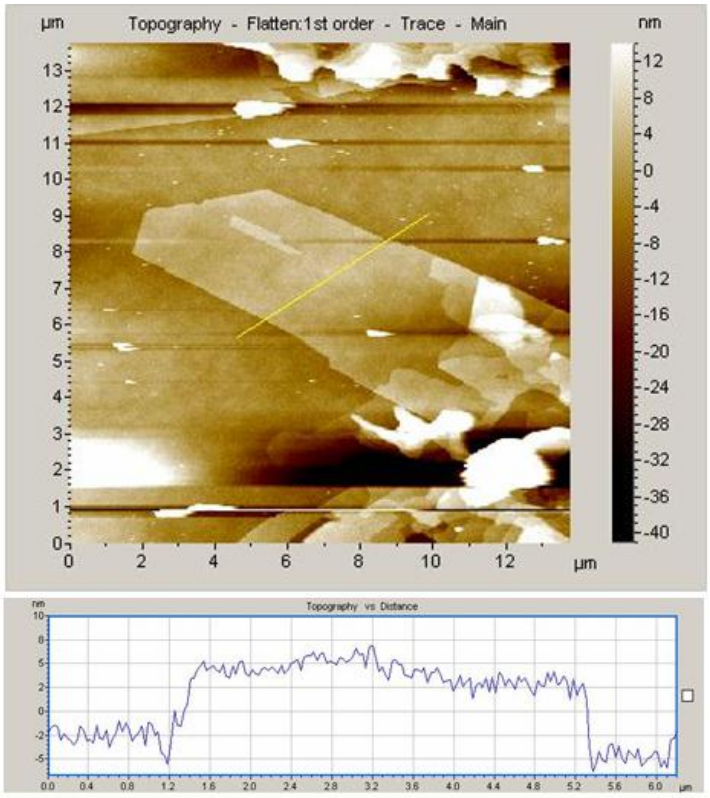

Fig. S1. AFM image of the prepared RGO, the height of the RGO sheets is 1.610 nm.

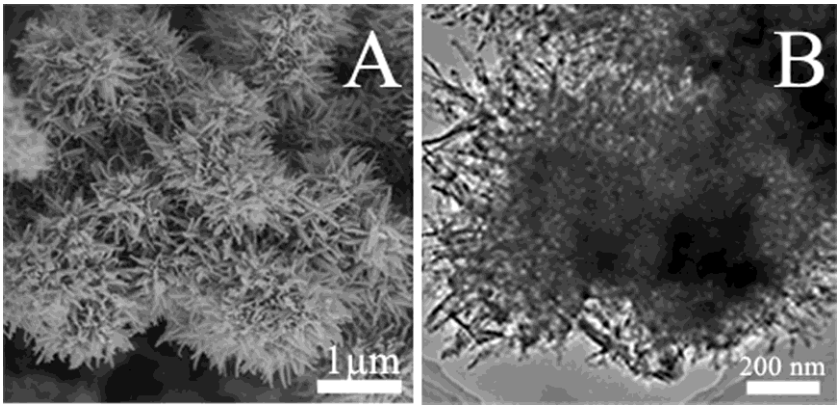

Fig. S2. SEM (A) and TEM (B) images of the obtained pure TiO_2.

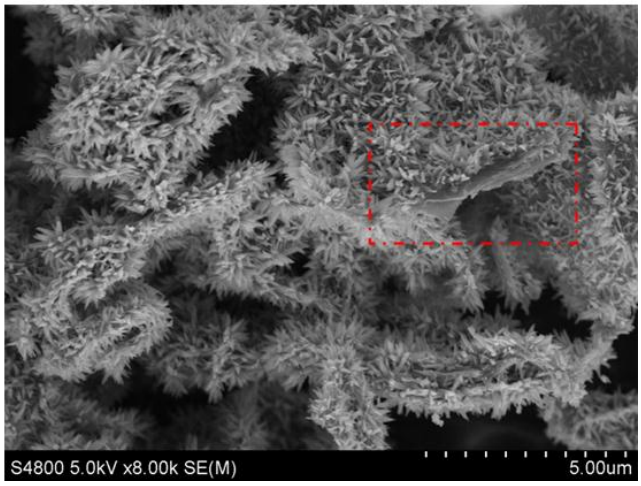

Fig. S3. SEM image of the 3wt% RGO-TiO_2 composite.

Fig. S3 showed that the surface of each RGO nanosheet was covered with the uniform and upstanding anatase TiO_2 nanowires from the red rectangle frame part of SEM image.

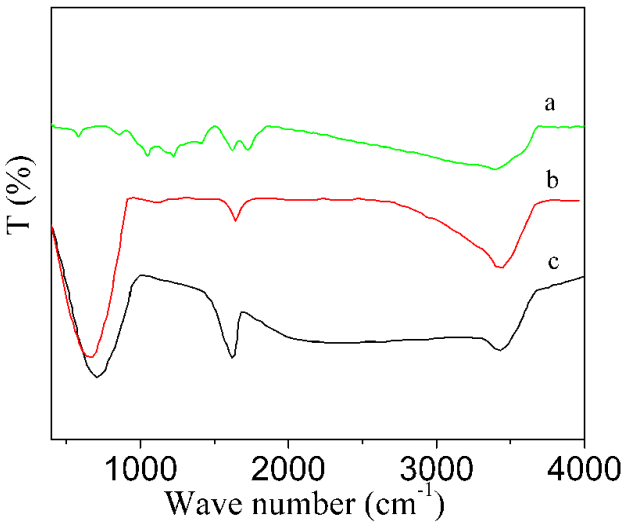

Fig. S4. Fourier transform infrared (FTIR) spectra of GO (a), TiO_2 (b) and 3wt% RGO-TiO_2 composite (c).

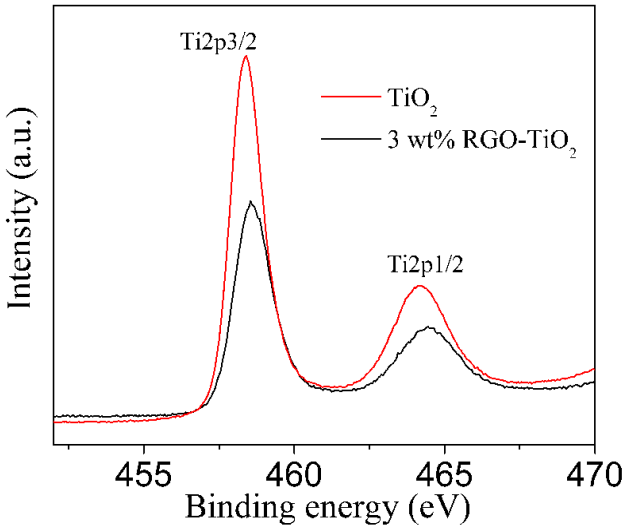

Fig. S5. XPS spectra of Ti 2p of TiO_2 and 3wt% RGO-TiO_2 composite.

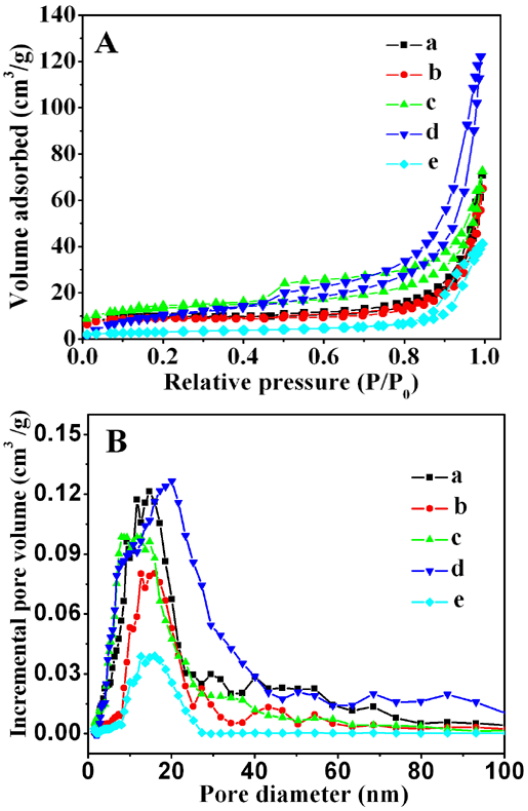

Fig. S6. N_2 adsorption-desorption isotherm curves (A) and DFT pore size distributions (B) of the different samples: 2 wt% RGO-TiO_2 (a), 3 wt% RGO-TiO_2 (b), 4 wt% RGO-TiO_2 (c), 5 wt% RGO-TiO_2 (d), TiO_2 (e).

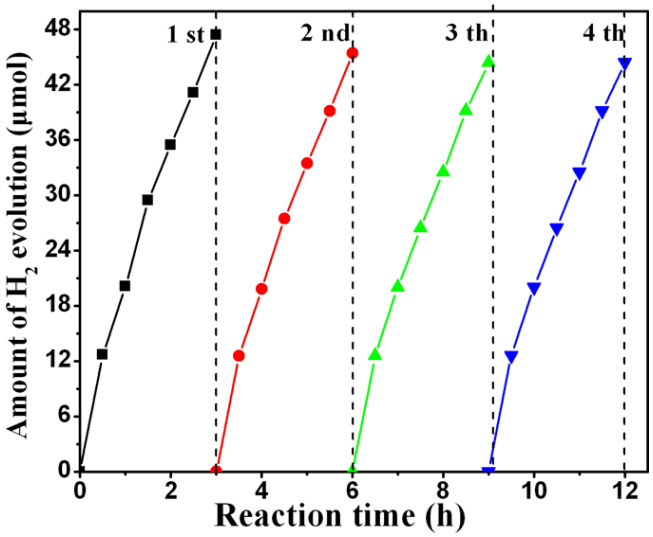

Fig. S7. Time course of photocatalytic H_2-production over the hierarchical 3 wt% RGO-TiO_2 composite (0.07 g).

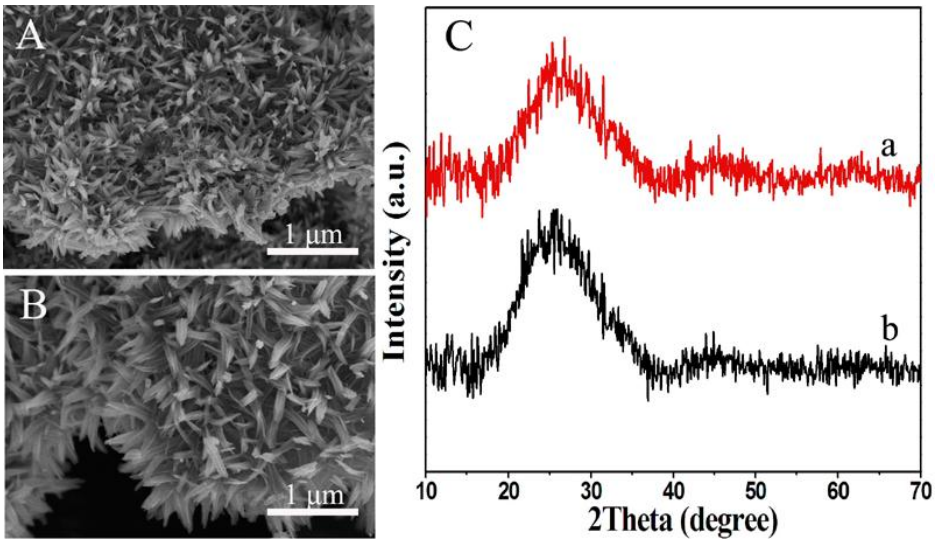

Fig. S8. SEM images of the hierarchical 3 wt% RGO-TiO_2 composite before (A) and after (B) the photocatalytic H_2 evolution reaction; XRD pattern (C) of the hierarchical 3wt% RGO-TiO_2 composite before (a) and after (b) the photocatalytic H_2 evolution reaction.

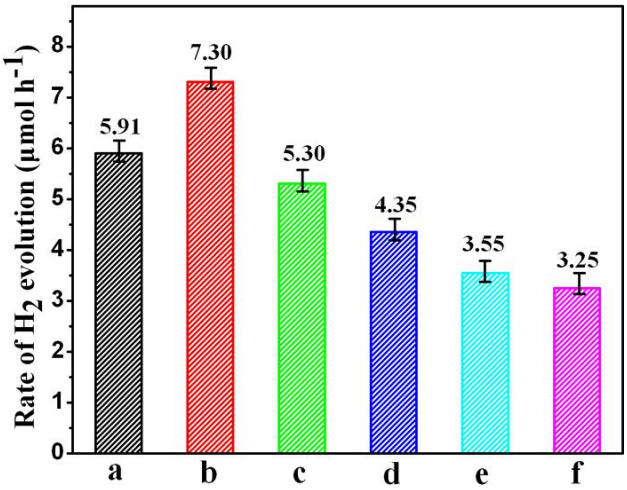

Fig. S9. Effect of EDTA as electron donors on the photocatalytic H_2 evolution rates under UV light illumination: 2 wt% RGO-TiO_2 (a), 3 wt% RGO-TiO_2 (b), 4 wt% RGO-TiO_2 (c), 5 wt% RGO-TiO_2 (d), 3 wt% RGO-TiO_2 generated by mechanically mixing (e) and pure TiO_2 (f). Catalyst amount is 0.07 g.

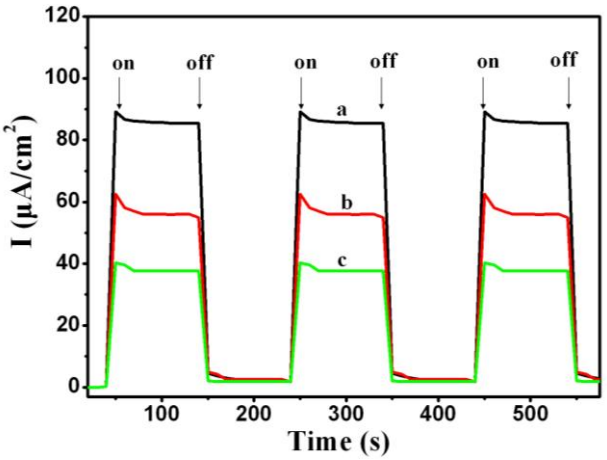

Fig. S10. The transient photocurrent density vs. time plotted for the different samples, hierarchical 3 wt% RGO-TiO_2 composite (a), 3 wt% RGO-TiO_2 generated by mechanically mixing (b), and TiO_2 (c).