

Electronic Supplementary Information

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Photocatalytic Hydrogen Generation from Water using a Hybrid of Graphene Nanoplatelets and Self Doped $\text{TiO}_2\text{-Pd}$

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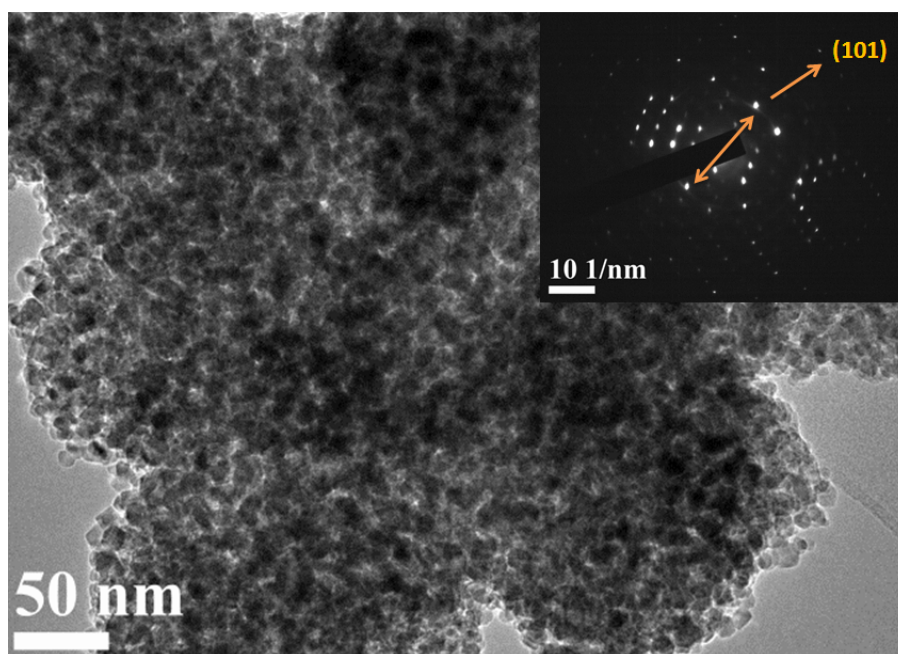


Figure S1. TEM and SAED pattern of TiO_2R .

S2. Table 1. Positions of D and G band, FWHM of D and G band, intensity ratio of D and G band (I_D/I_G) as obtained from Raman spectra

	G	TiO ₂ R-1G	TiO ₂ R-3G	TiO ₂ R-5G
Position of D band (cm ⁻¹)	1364	1393	1385	1372
Position of G band (cm ⁻¹)	1583	1587	1372	1579
FWHM of D band (cm ⁻¹)	48	247	203	238
FWHM of G band (cm ⁻¹)	30	91	84	88
I_D/I_G	0.3	2.5	1.4	1.7

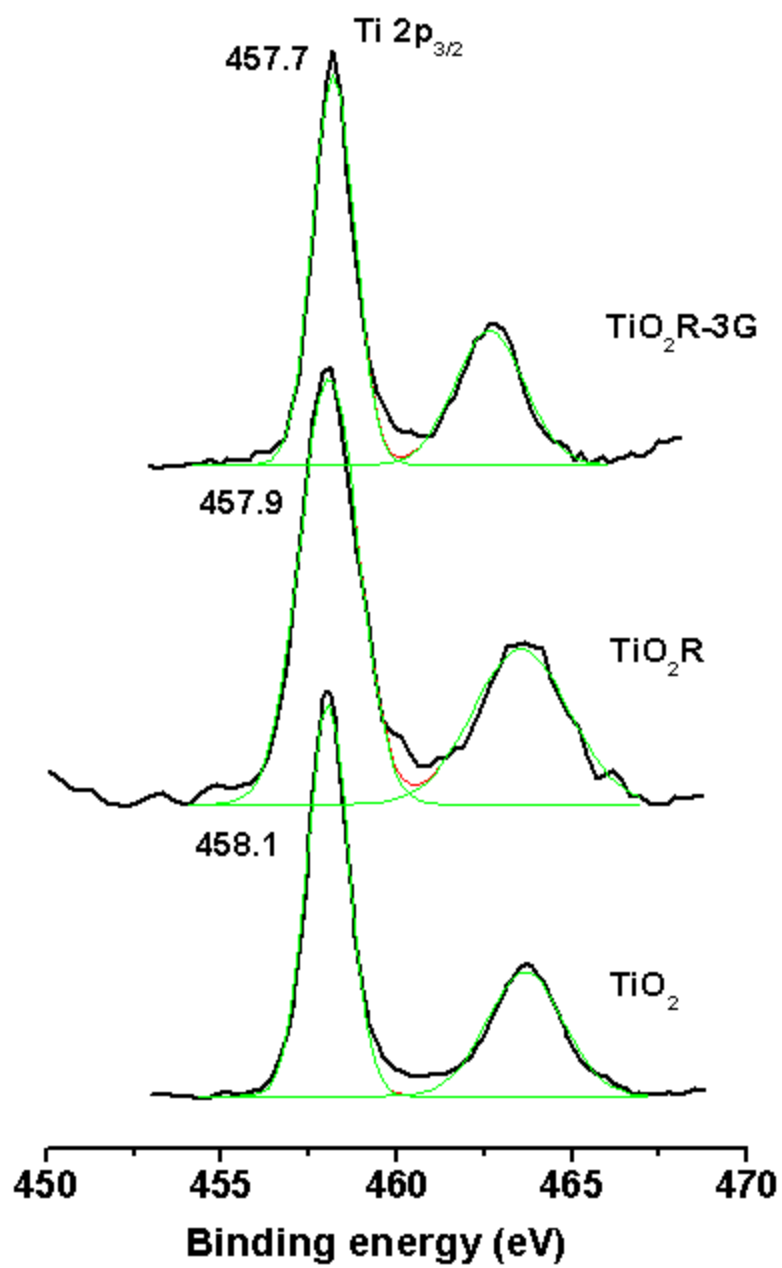


Figure S3 XPS of TiO₂, TiO₂R and TiO₂R-3G

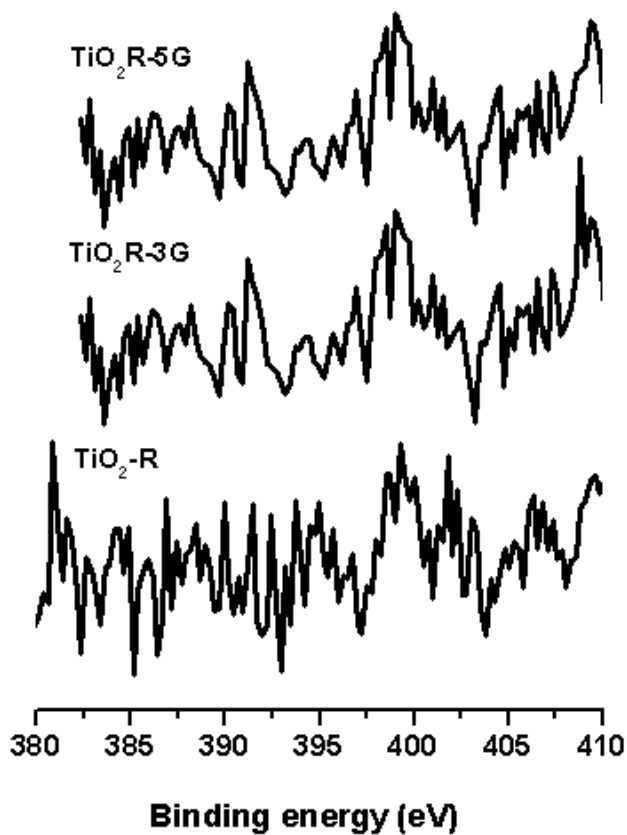


Figure S4. N1s XPS of TiO₂R, TiO₂R-3G and TiO₂R-5G

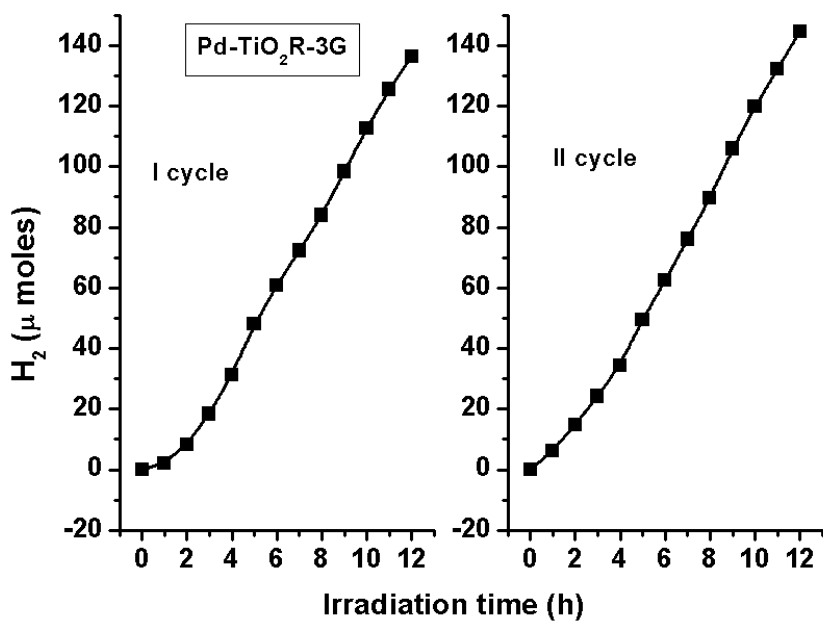


Figure S5. Photocatalytic activity of Pd-TiO₂R-3G for 1st and 2nd cycles

S6. Details of the photocatalytic reactor and irradiation chamber

Photocatalytic activity was studied in a tubular quartz reactor of length 13 cm and diameter 2 cm closed with a teflon stopcock. It was also provided with a side tube closed with silicone rubber septum through which gas mixture could be removed for analysis. Samples were irradiated in a circular chamber of internal diameter 44 cm and height 46 cm fixed with eight ordinary day light fluorescent lamps (Wipro, 36 watts each, emissive length of the tube ~37 cm and radius 1.5 cm) vertically and symmetrically on the walls. Spectrum of the lamp consisted of fluorescent emission predominantly in the visible region along with a UV contribution of ~3%. The reactor was placed at the centre of the circular irradiation chamber vertically.

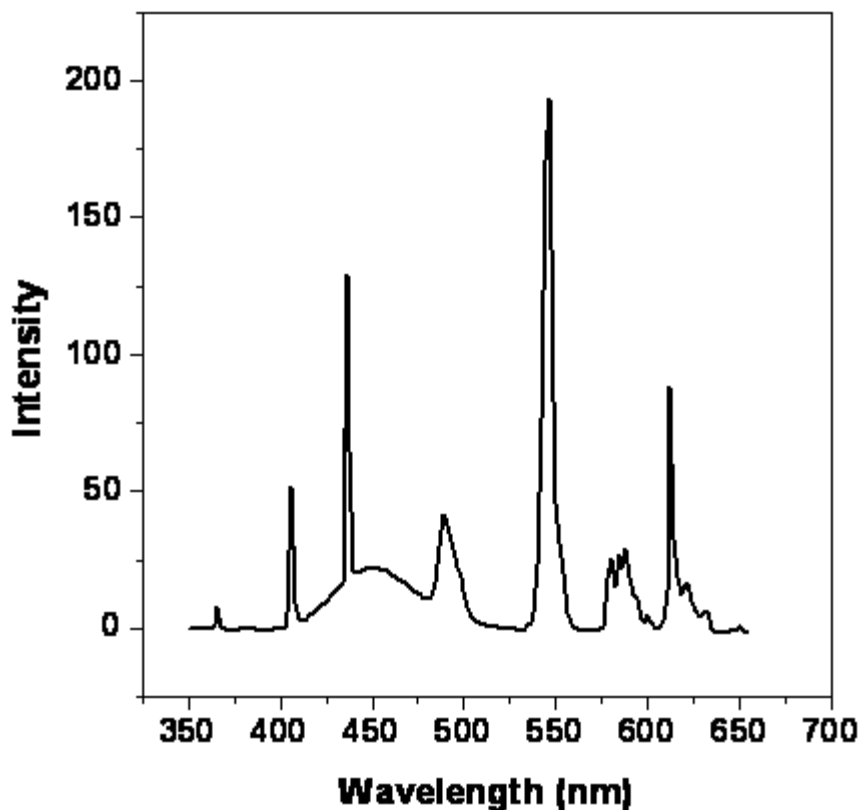


Figure S7. Emission profile of the fluorescent lamp used for photocatalysis