

Supplementary Information

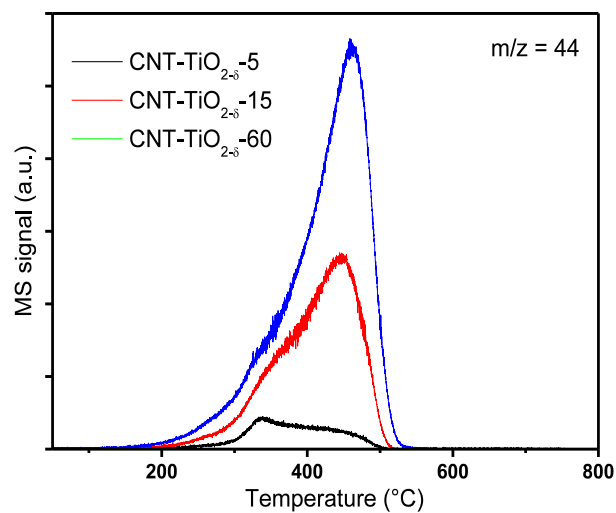


Figure S1. MS profiles ($m/z = 44$) for the CNT-TiO_{2-δ} composites recorded in a mass spectrometer coupled in the exhaust stream of TG analysis.

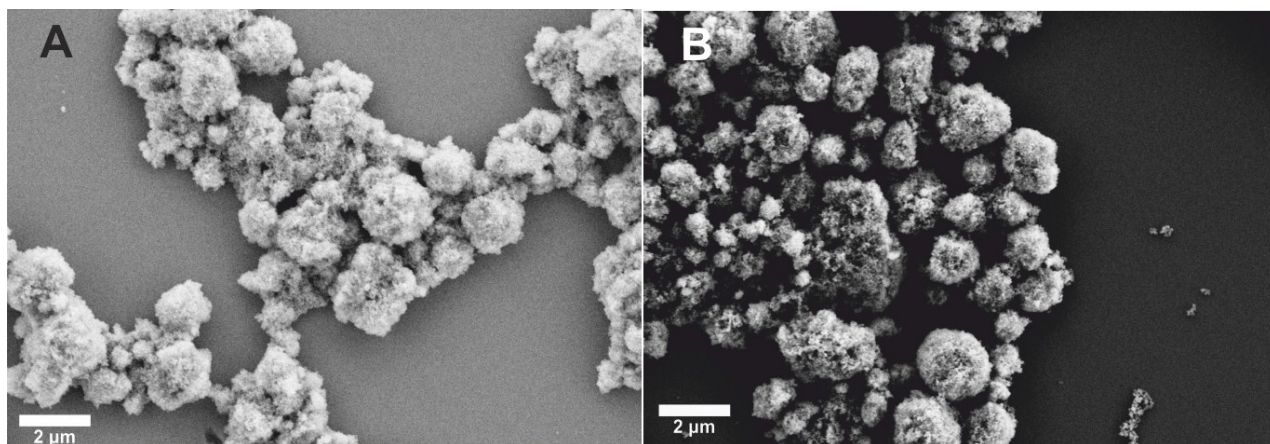


Figure S2. SEM images for pristine TiO₂ and TiO_{2-δ}.

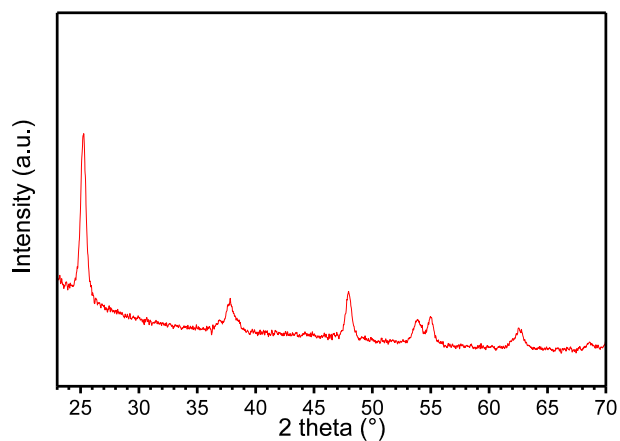


Figure S3. XRD pattern of CVD-synthesized FeO_x/TiO₂ composite used as catalyst for CNT growth.

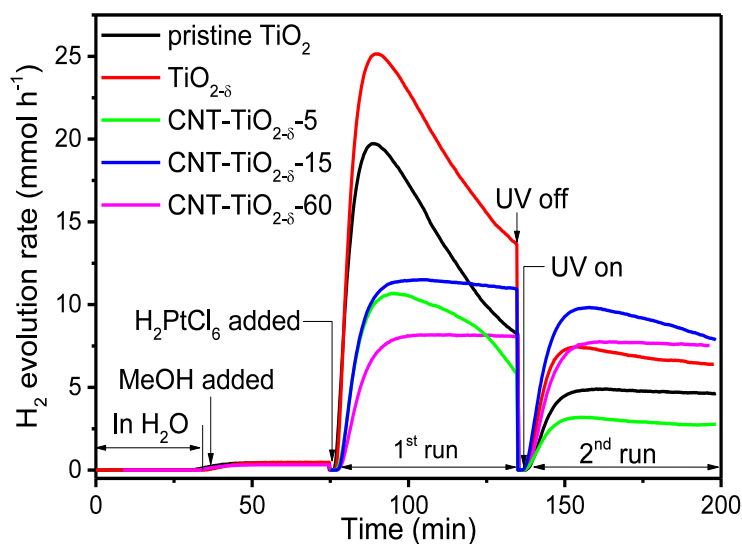


Figure S4. Temporal H₂ evolution rates in pure water, in water/methanol mixture and after the addition of H₂PtCl₆ precursor.

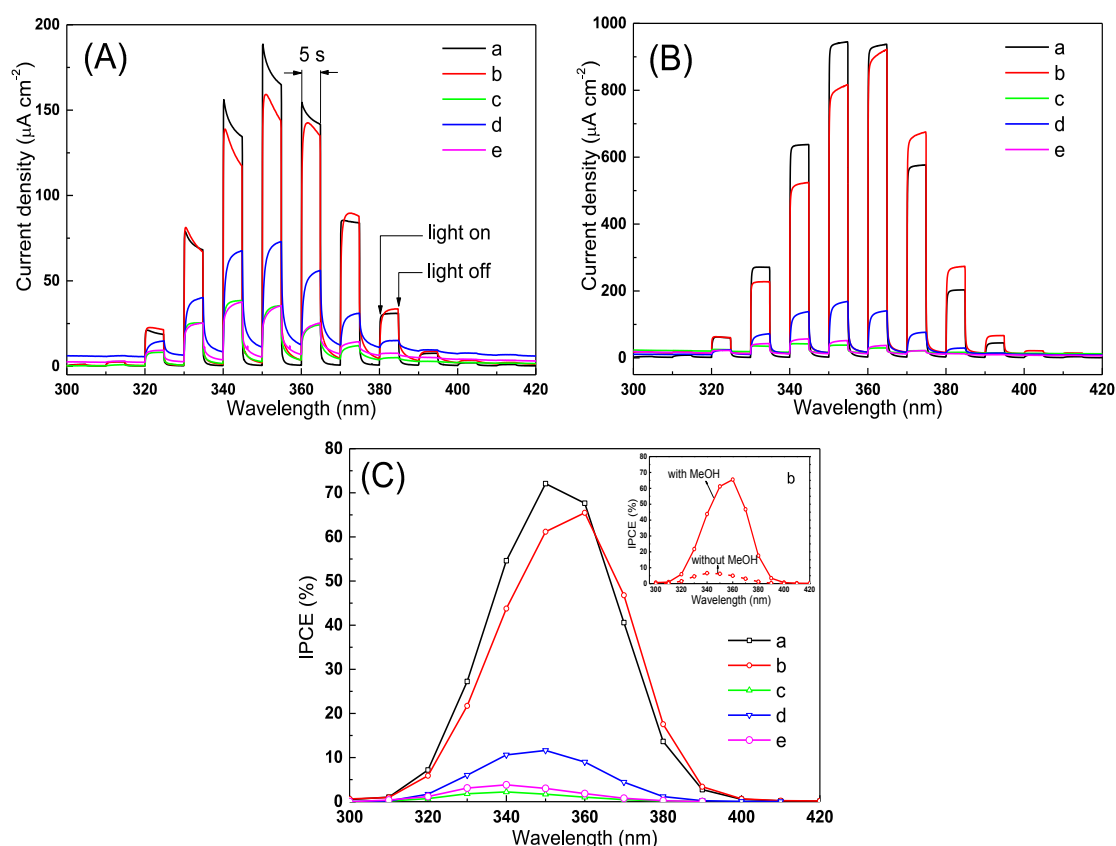


Figure S5. Photocurrent responses under intermittent irradiation at different wavelengths in a phosphate buffer (pH 7.0) at 0.5 V vs. Ag/AgCl without (A) and with (B) methanol (2 mL); incident photon-to-current efficiency (IPCE) in the presence of methanol calculated based on the photocurrent responses (C). Inserted figure in (C): IPCE of TiO_{2-δ} with and without methanol. Samples a, b, c, d and e refer to pristine TiO₂, TiO_{2-δ}, CNT-TiO_{2-δ}-5, CNTs-TiO_{2-δ}-15 and CNTs-TiO_{2-δ}-60, respectively.

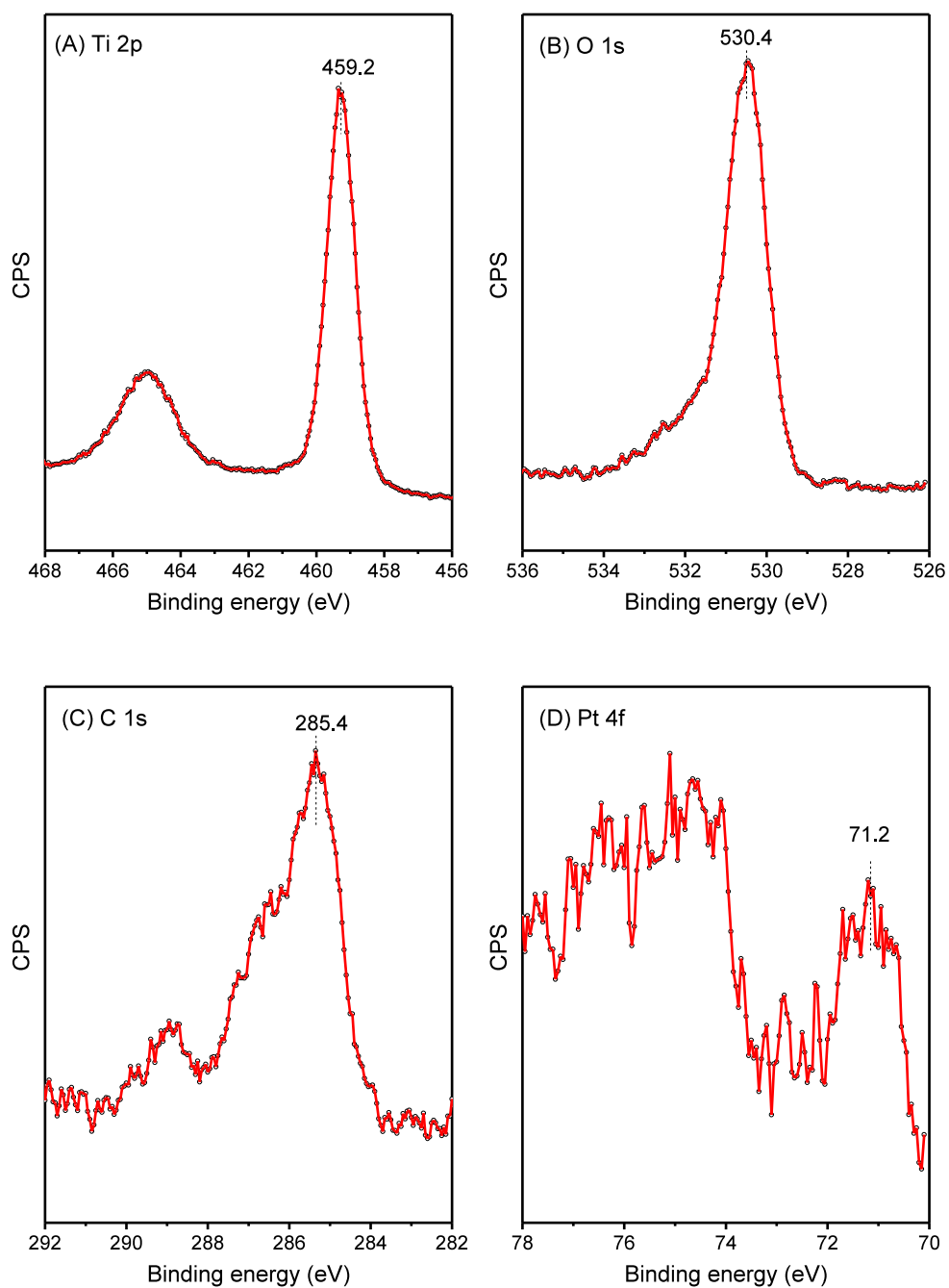


Figure S6. XP Ti 2p (A), O 1s (B), C 1s (C) and Pt 4f (D) spectra for pristine TiO₂ with photodeposited Pt (0.1 wt%) after photocatalytic reactions.

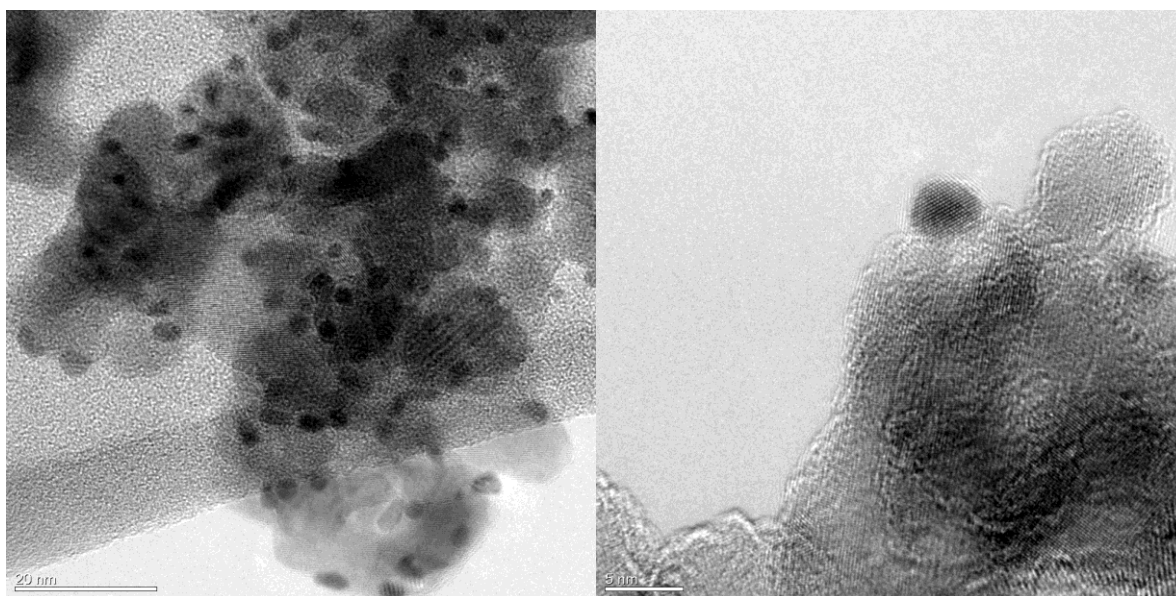


Figure S7. TEM images for photodeposited Pt nanoparticles on $\text{TiO}_{2-\delta}$.

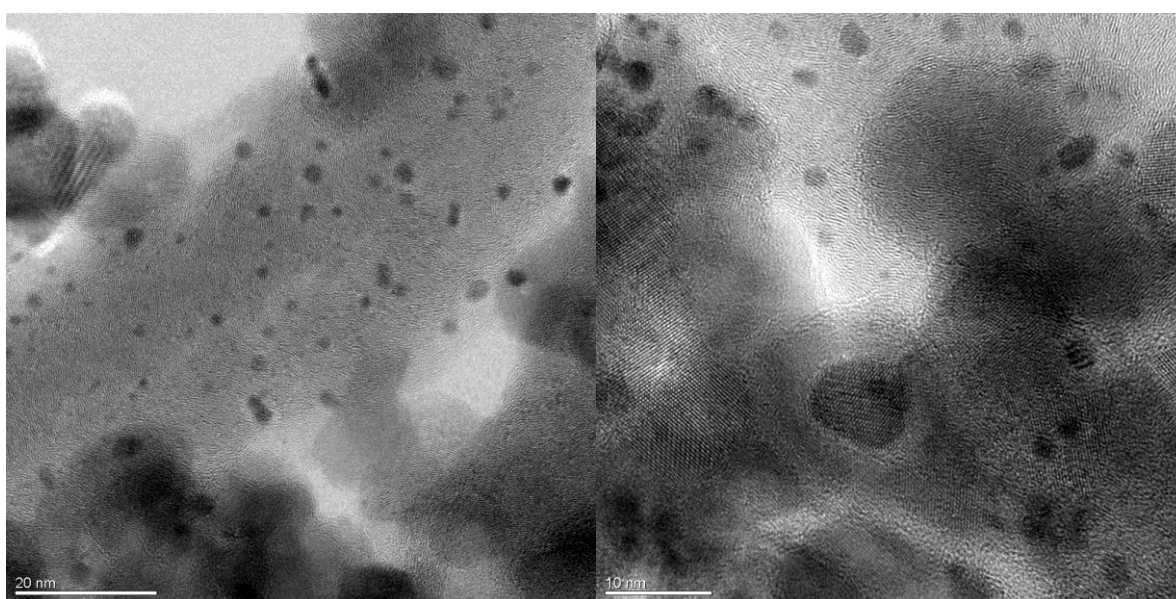


Figure S8. TEM images for photodeposited Pt nanoparticles on CNT- $\text{TiO}_{2-\delta}$ -60.

Table S1. Surface compositions (in atomic percent, at%) of the TiO_2 photocatalysts after reactions derived from the quantitative XPS studies. Platinum (0.1 wt%) was photodeposited as co-catalyst.

	C	O	Ti	Pt
TiO_2	20.05	56.60	23.21	0.14