

Table S1. Table of the samples (pt-mDDn-Tt)

Sapmle ID	titanium sol (mL)	Chitosan (g)	degree of deacety- lation (%)	Temperature (°C)	Time (h)
1# Pt-T200	25	0	/	200	3
2# Pt-10%DD25- T200	25	0.075	25	200	3
3# Pt-10%DD45- T200	25	0.075	45	200	3
4# Pt-10%DD65- T200	25	0.075	65	200	3
5# Pt-10%DD75- T200	25	0.075	75	200	3
6# Pt-10%DD85- T200	25	0.075	85	200	3
7# Pt-10%DD95- T200	25	0.075	95	200	3
8# Pt-5%DD75- T200	25	0.0355	75	200	3
9# Pt-20%DD75- T200	25	0.169	75	200	3
10# Pt-10%DD75- T150	25	0.075	75	150	3
11# Pt-10%DD75- T250	25	0.075	75	250	3

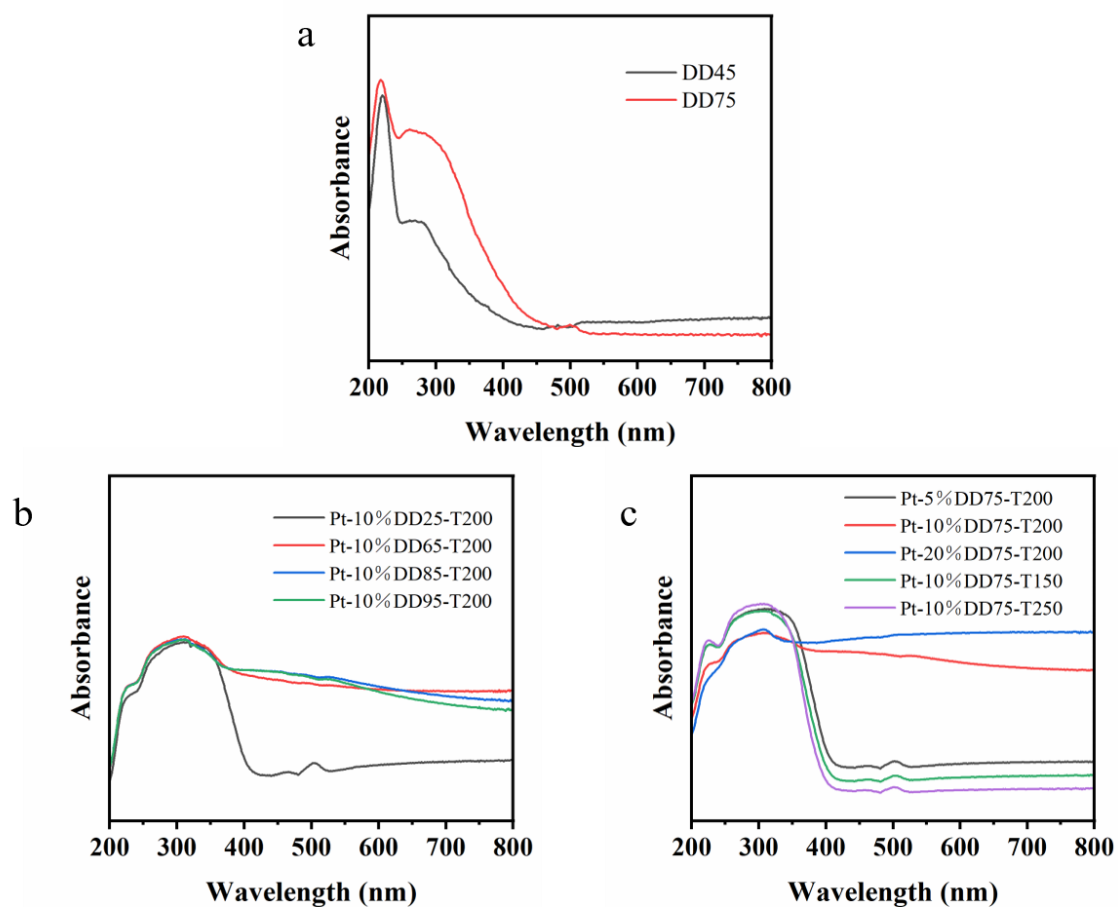


Figure S1. UV-vis diffuse reflectance spectra of as-prepare Pt-Chitosan-TiO₂ samples.

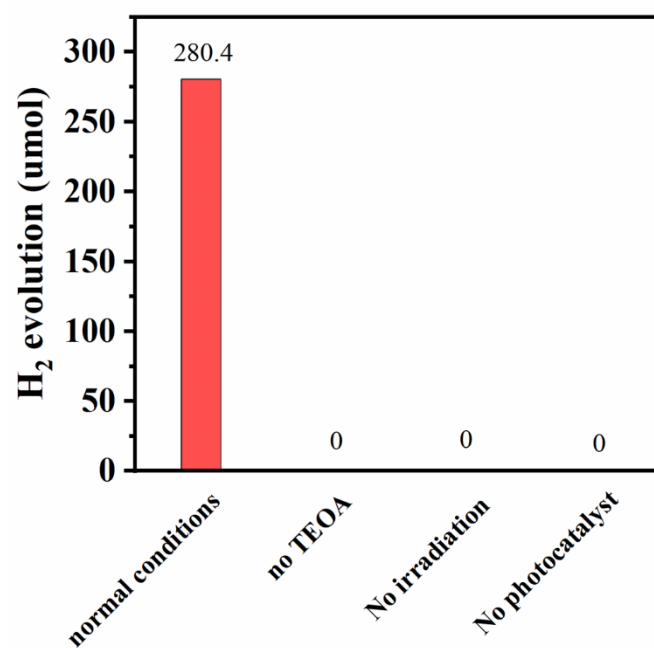


Figure S2. Control experiments for photocatalytic H₂ evolution reaction over Pt-10%DD75-T200.

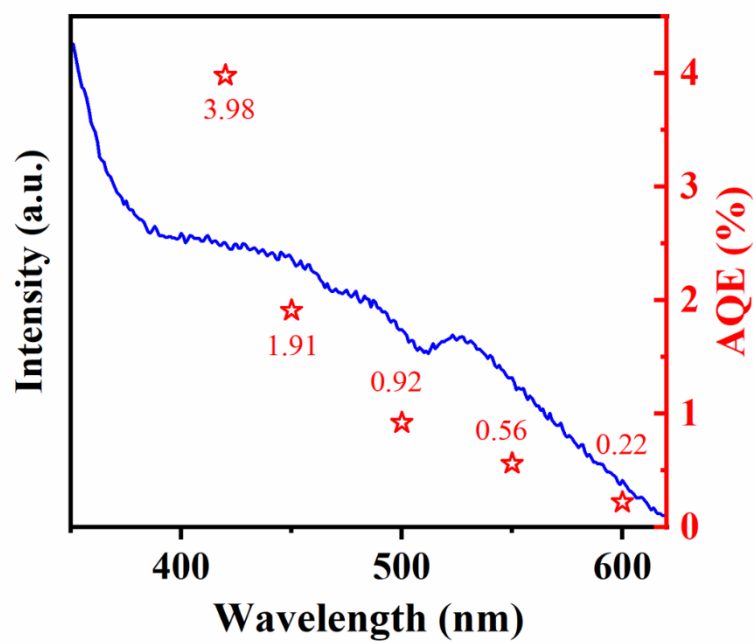


Figure S3. Action spectra of Pt-10%DD75-T200 (illumination time: 1h, 10 vol% TEOA, pH = 11.3, 278 K).

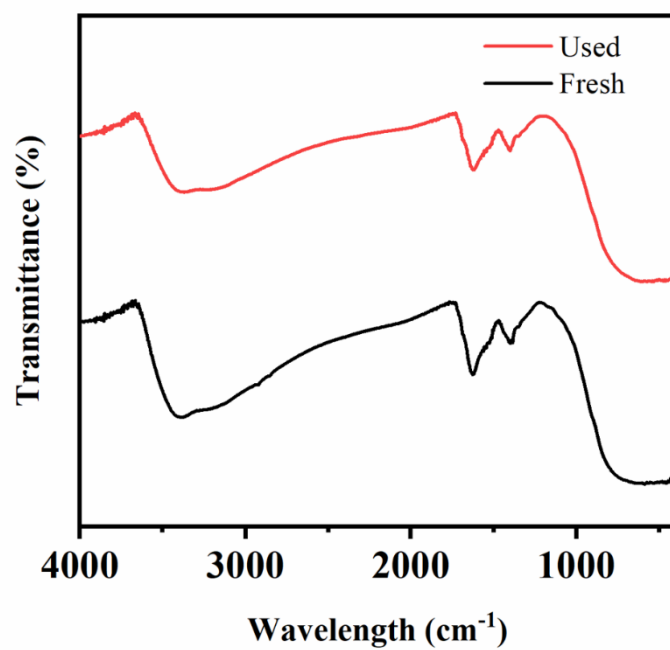


Figure S4. FT-IR spectra of Pt-10%DD75-T200 before and after irradiation.

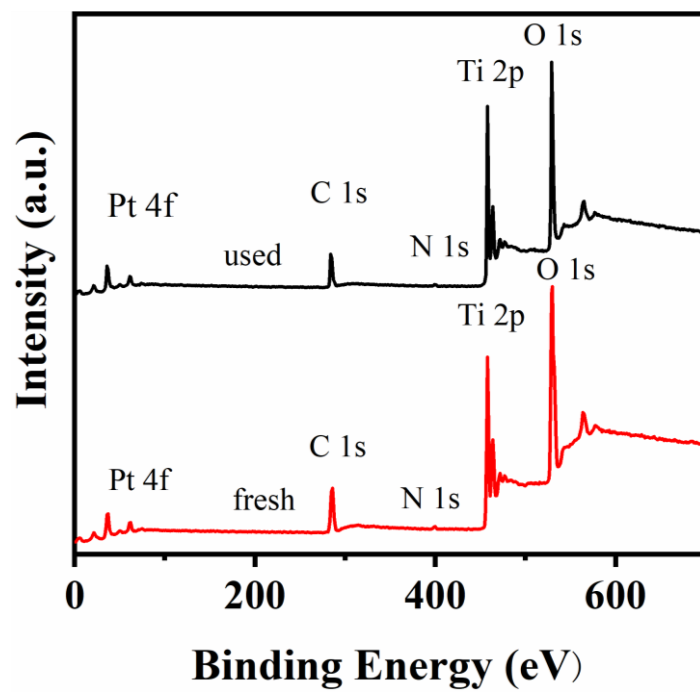


Figure S5. XPS spectra of Pt-10%DD75-T200 before and after irradiation.

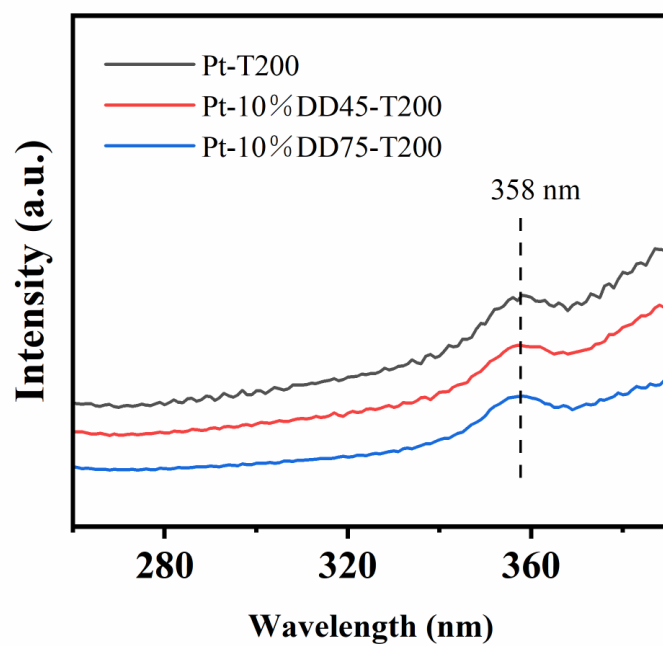


Figure S6. Excitation spectra of Pt-T200, Pt-10%DD45-T200 and Pt-10%DD75-T200.