

Supporting Information

Post-polymerisation functionalisation of conjugated polymers: oligoether side-chain length governs exciton lifetime and dissociation for enhanced photocatalytic hydrogen evolution

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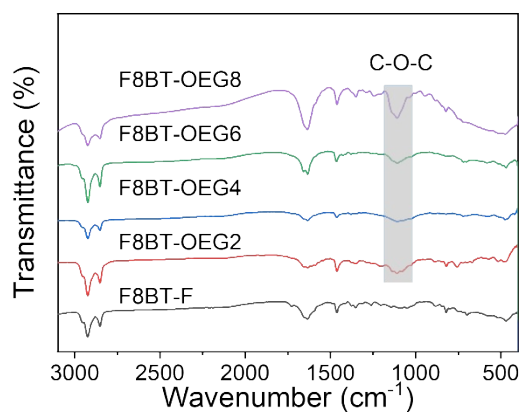


Figure S1. FT-IR spectra of the polymers.

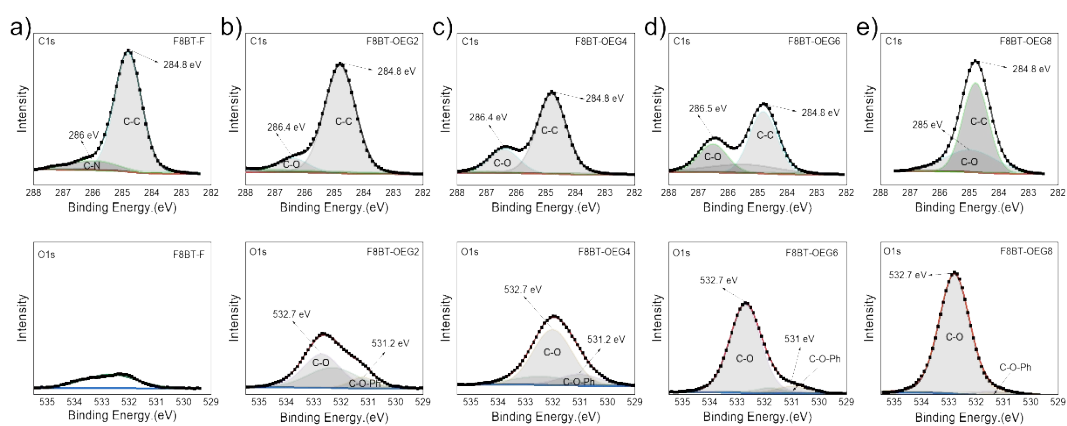


Figure S2. C 1s and O 1s XPS spectra of (a) F8BT-F, (b) F8BT-OEG2, (c) F8BT-OEG4, (d) F8BT-OEG6 and (e) F8BT-OEG8.

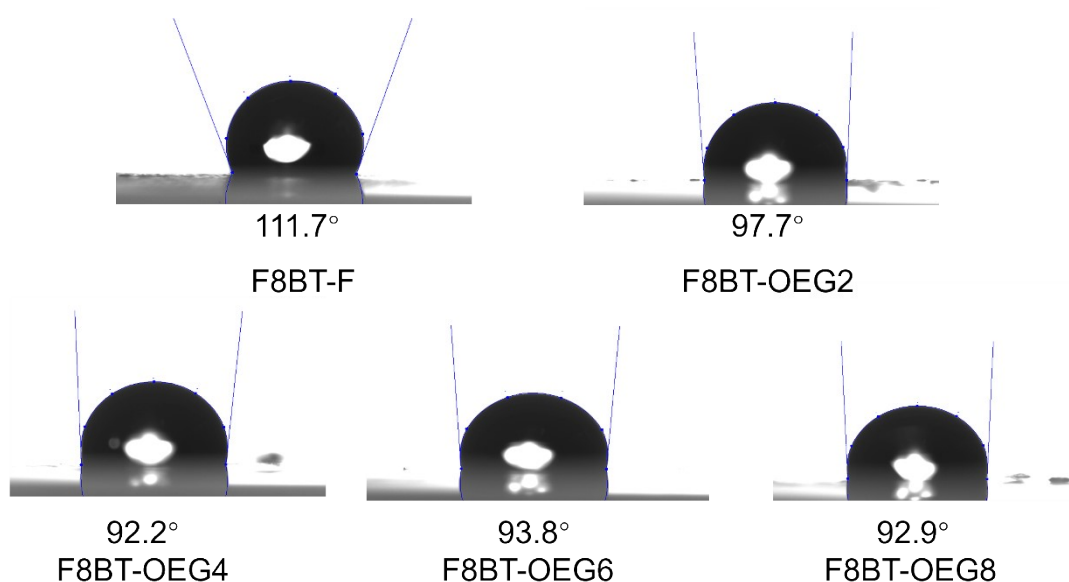


Figure S3. Contact angles of the polymer films with water.

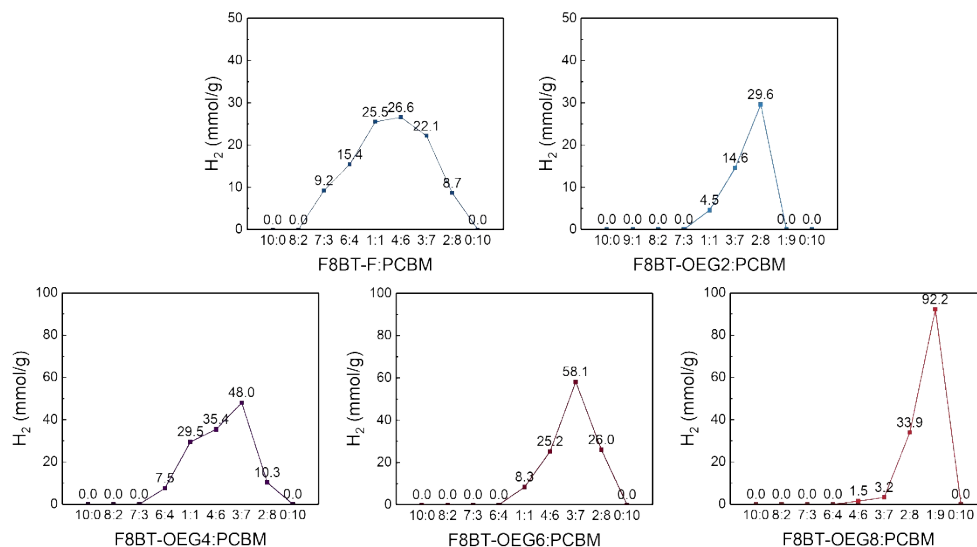


Figure S4. Screening of the optimal D:A (*w/w*) ratios for F8BT-F:PCBM and F8BT-OEGN:PCBM photocatalysts.

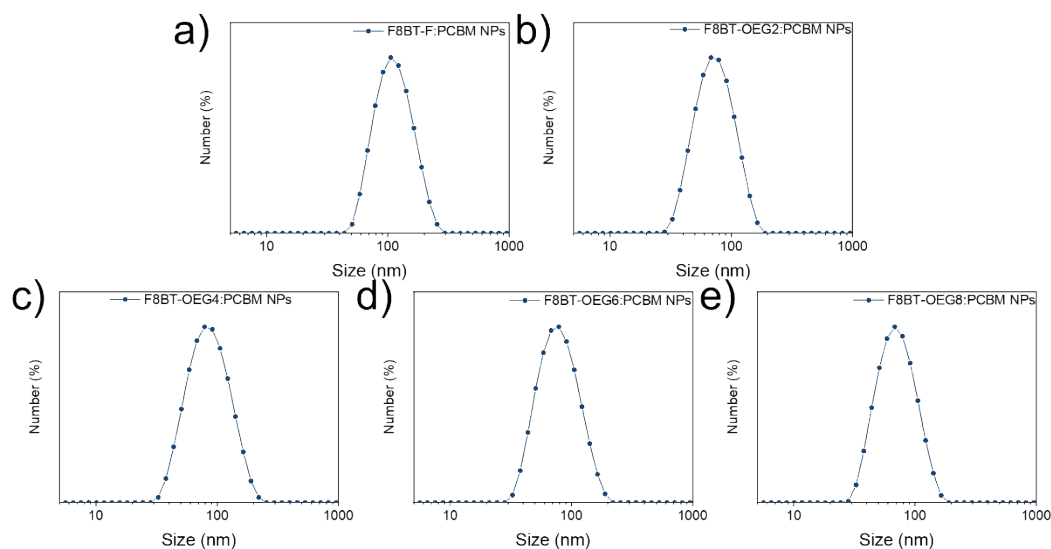


Figure S5. DLS size distribution by intensities of the as-prepared (a) F8BT-F:PCBM, (b) F8BT-OEG2:PCBM, (c) F8BT-OEG4:PCBM, (d) F8BT-OEG6:PCBM, and (e) F8BT-OEG8:PCBM nanoparticles.

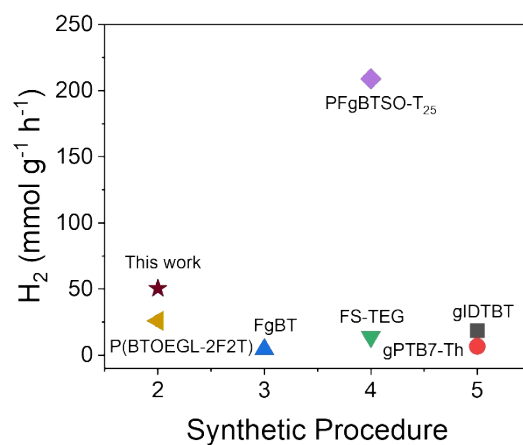


Figure S6. Comparison of HER rates and synthetic steps for representative OEG-functionalized polymer photocatalysts.¹⁻⁴

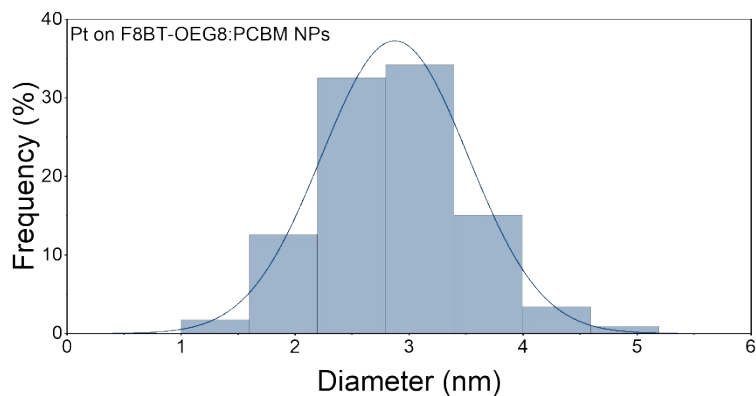


Figure S7. Particle size distribution histogram of Pt nanoparticles photodeposited on F8BT-OEG8:PCBM.

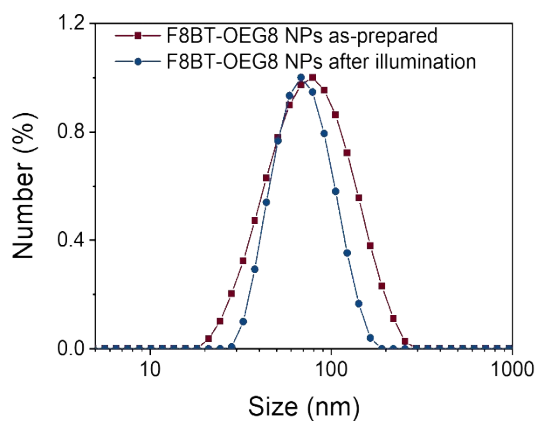


Figure S8. DLS particle size distributions of F8BT-OEG8:PCBM nanoparticles before and after 8 h of photocatalytic H₂ evolution.

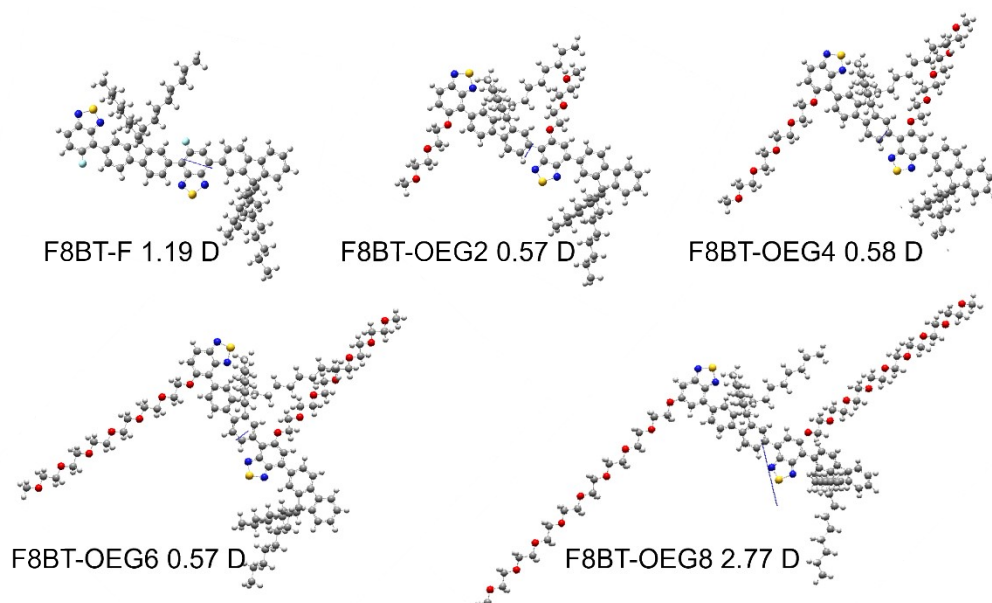


Figure S9. Calculated optimal molecular geometries and dipole moments.

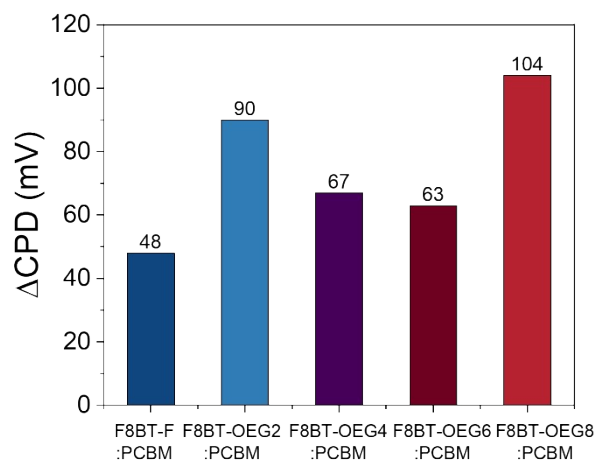


Figure S10. Maximum contact potential difference (CPD) values of F8BT-F:PCBM and F8BT-OEGN (N = 2, 4, 6, 8):PCBM films extracted from KPFM images.

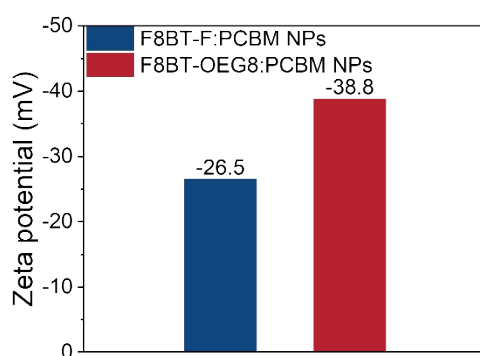


Figure S11. The zeta potentials of the as-prepared F8BT-F:PCBM and F8BT-OEG8:PCBM nanoparticles.

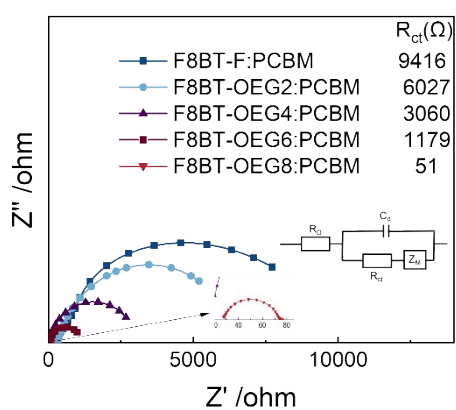


Figure S12. Electrochemical impedance spectra of the photocatalysts.

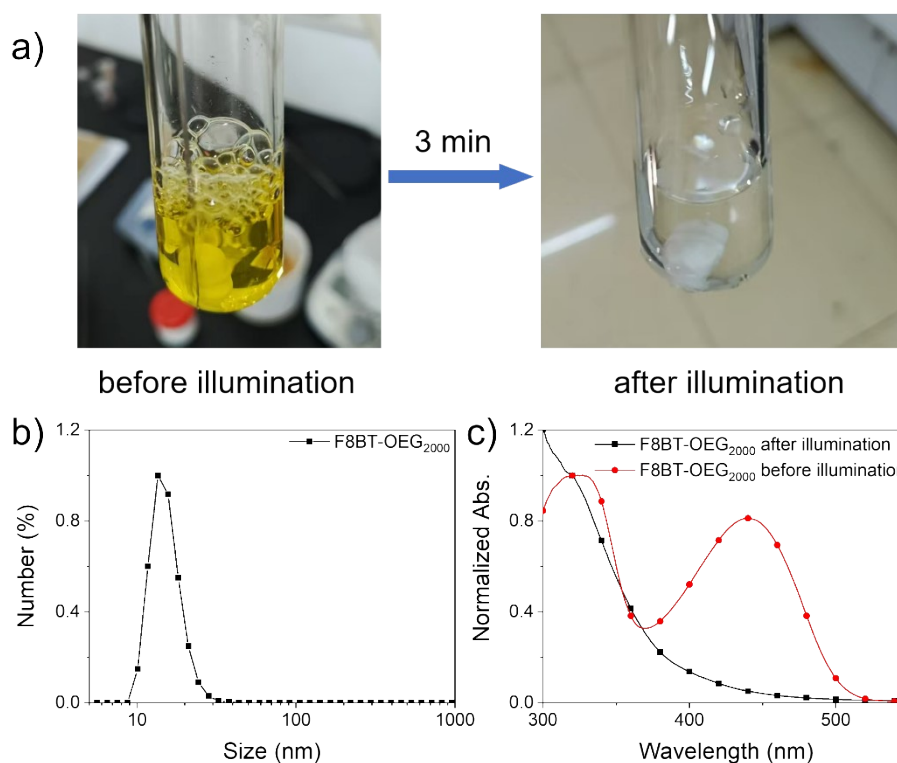


Figure S13. Electrochemical impedance spectra of the photocatalysts.

Table S1. Fitting parameters for the time-resolved PL decay curves of F8BT-OEGN in chloroform solutions.

Sample	τ_1 (ns)	f_1 (%)	τ_2 (ns)	f_2 (%)	χ^2	τ (ns) average lifetime
F8BT-F	2.83	96.44	14.96	3.56	1.147	4.81
F8BT-OEG2	4.05	96.02	16.14	3.98	1.087	5.76
F8BT-OEG4	4.06	96.06	16.30	3.94	1.212	5.80
F8BT-OEG6	3.89	95.09	13.77	4.91	1.038	5.26
F8BT-OEG8	4.02	95.38	15.05	4.62	1.140	5.65

References

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