Supporting Information

Pyrene-Functionalized Polymeric Carbon Nitride with Promoted Aqueous-Organic Biphasic Photocatalytic CO_2 Reduction

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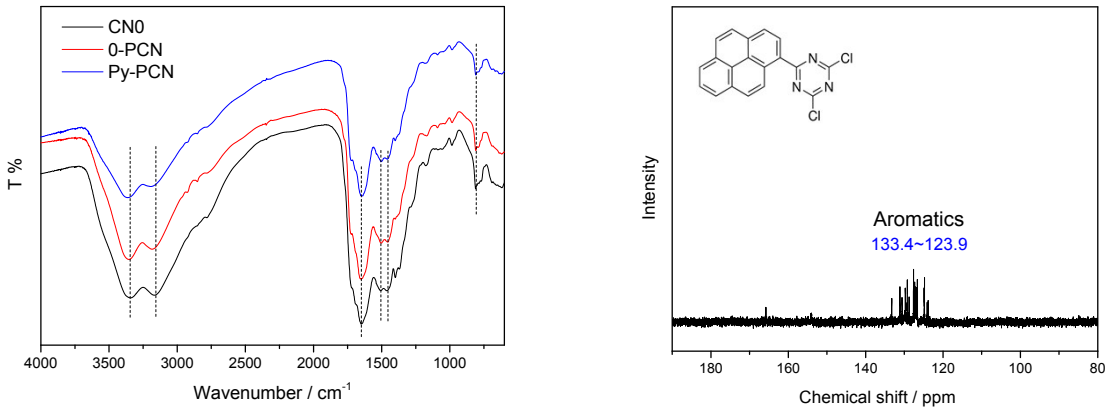

Fig. S1. (left) FTIR spectra of CN0, 0-PCN, and Py-PCN; (right) ^{13}C-NMR spectrum of precursor (1-(4,6-Dichloro-1,3,5-triazin-2-yl)pyrene)

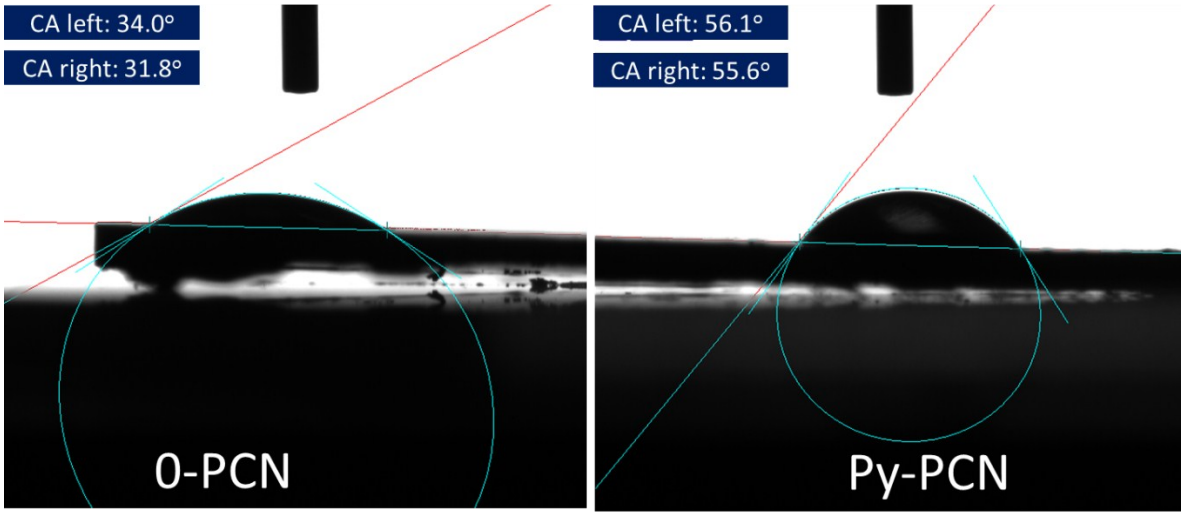

Fig. S2. The shapes of water drops and contact angle on 0-PCN and Py-PCN tablets.

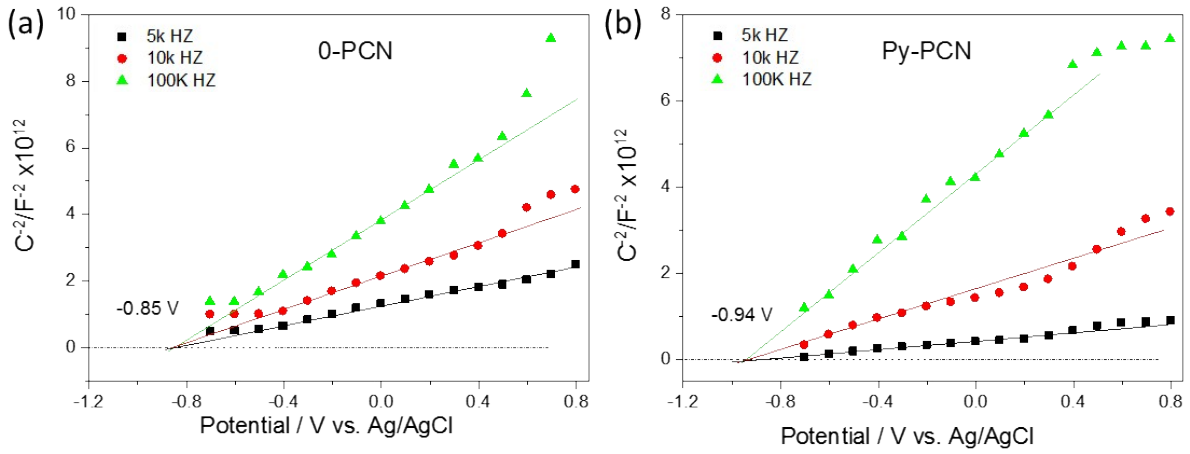

Fig. S3. Mott-Schottky plots for the (a) 0-PCN and (b) Py-PCN.

Table S1. Elemental analysis results for the CN0, 0-PCN and Py-PCN samples.

Samples	Element content (wt. %)			
	C	N	Cl	H
CN0	33.06	48.36	5.62	3.37
0-PCN	32.15	49.83	4.14	3.16
Py-PCN	34.86	51.02	4.45	4.21

Table S2. Bandgap, Conduction band and Valence band.

Sample	E_g /V	E_{cb} / V, *vs* NHE, pH 7	E_{vb} / V, *vs* NHE, pH 7
0-PCN	2.27	-1.07	1.20
Py-PCN	2.31	-1.16	1.15

The CB and VB potential *vs*. NHE is calculated as:

E (*vs*. NHE) = E (*vs*. Ag/AgCl) + $E_{Ag/AgCl}$ – 0.059 pH, ($E_{Ag/AgCl}$ = +0.197 V)

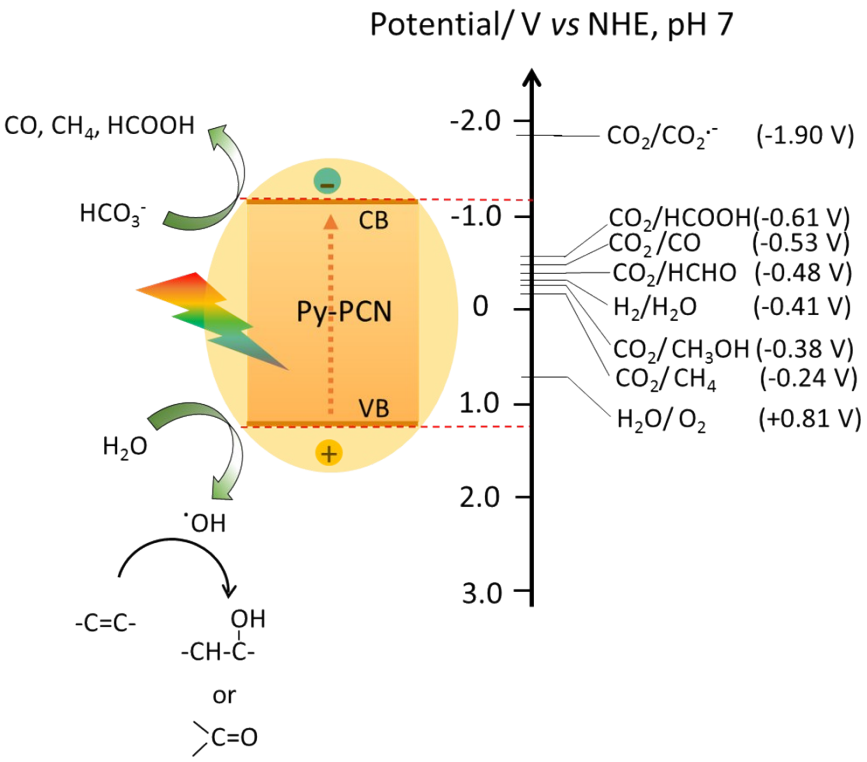

Fig. S4. Relationship between band potential of Py-PCN and CO_2 reduction, as well as involved organic reaction pathway

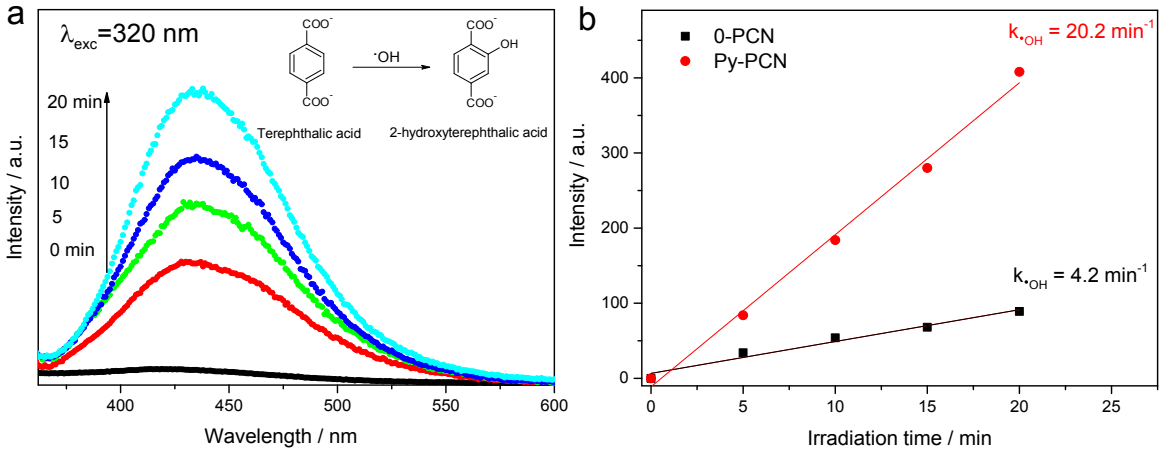

Fig. S5. (a) Representative fluorescence spectral changes (excitation wavelength, λ_{ex} = 320 nm) arising from TAOH aliquot produced from the oxidation of TA by hydroxyl radicals produced by irradiated Py-PCN after irradiation of 0.5 mM TA aqueous solution. (b) Kinetics of fluorescence intensity measured at 430 nm measured over photoexcited 0-PCN and Py-PCN as the source of hydroxyl radicals.

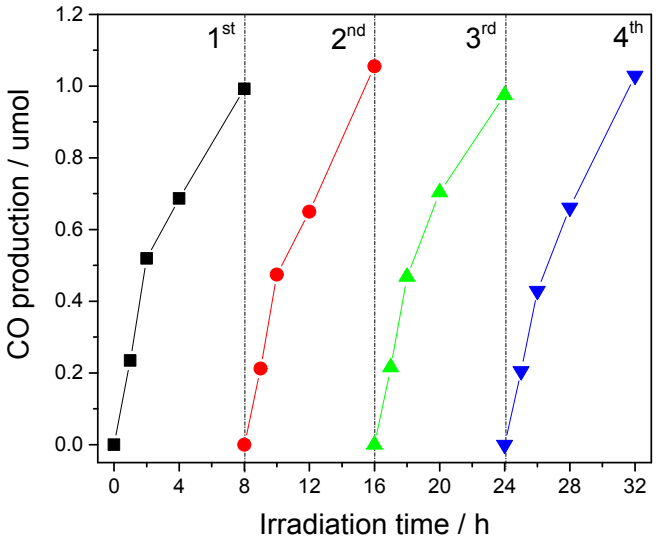

Fig. S6. Cycling test of photocatalytic CO_2 reduction over 10% Py-PCN. [Catalyst]=1.0 g/L; 9 ml cyclohexene as solvent and 1 ml of 3.0 M $NaHCO_3$ as CO_2 source. Light source: 300 W Xeon Lamp.