Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

One-pot green synthesis of water-soluble carbon nanodots with multicolor photoluminescence from polyethylene glycol

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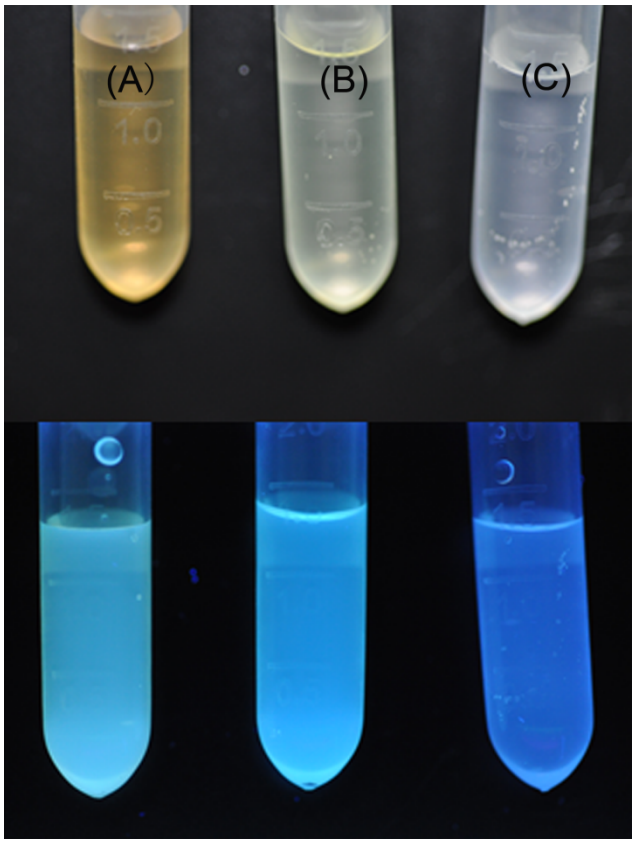
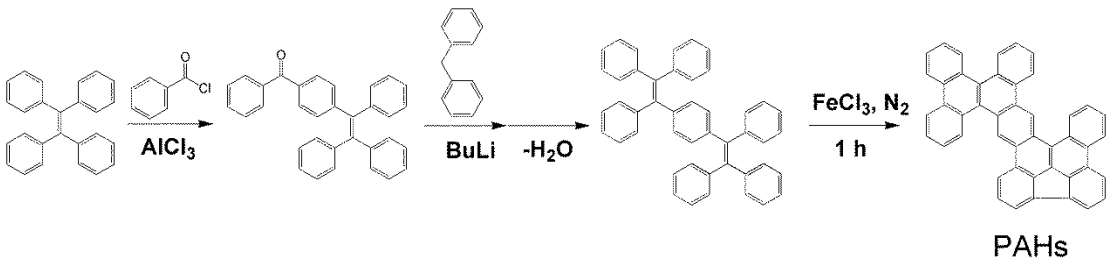


Fig. S1 The products originated from (A) PEG, (B) PPG and (C) PTMG at 160 ˚C for 2 h, respectively. (Top: under daylight, down: under 365 nm UV light).

PAHs: We utilized an efficient reaction route for preparing PAHs via a mild intramolecular oxidative cyclodehydrogenation (Scheme S1).



Scheme S1 Synthetic route for PAHs.

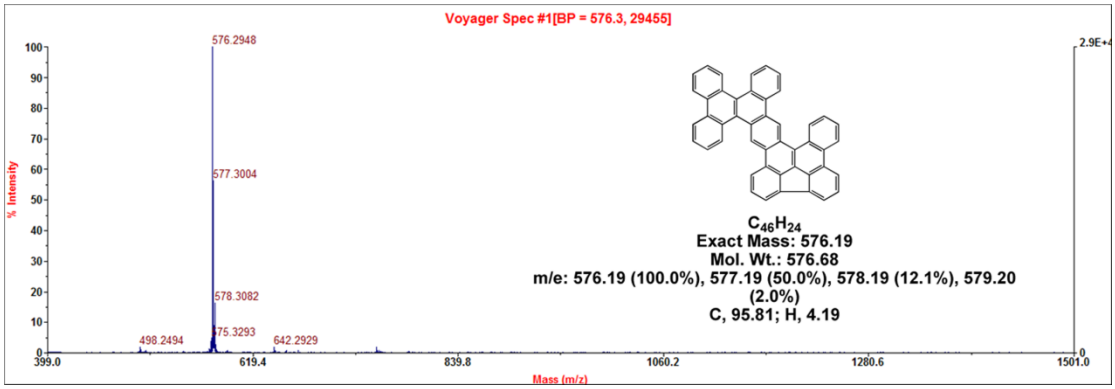


Fig. S2 High resolution mass spectrum (MOLDI-TOF) of PAHs.

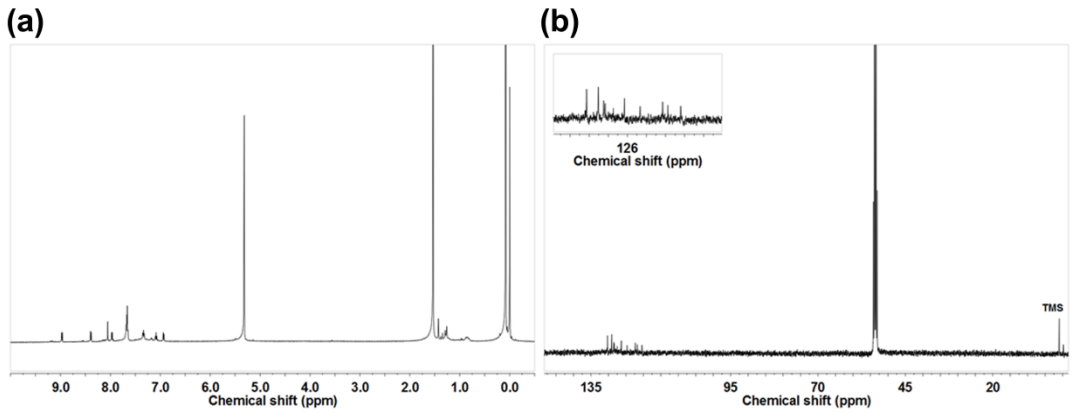


Fig. S3 ^{1}H NMR and ^{13}C NMR spectra of PAHs in CD_2Cl_2.

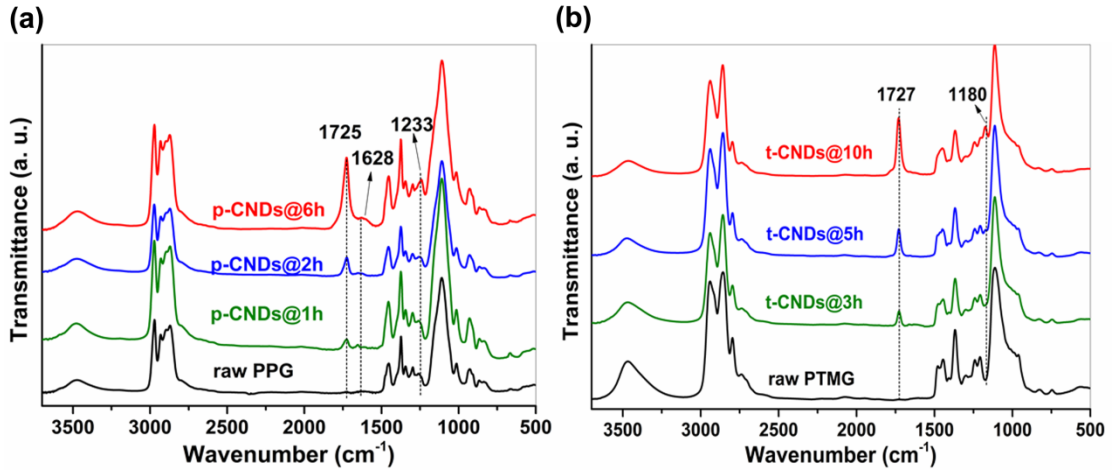


Fig. S4 FTIR spectra of (a) CNDs originated from PPG by heating for 1 h, denoted as p-CNDs@1h; 2 h, denoted as p-CNDs@2h; 6 h, denoted as p-CNDs@6h, (b). CNDs originated from PTMG by heating for 3 h, denoted as t-CNDs@3h; 5 h, denoted as t-CNDs@5h; 10 h, denoted as t-CNDs@10h.

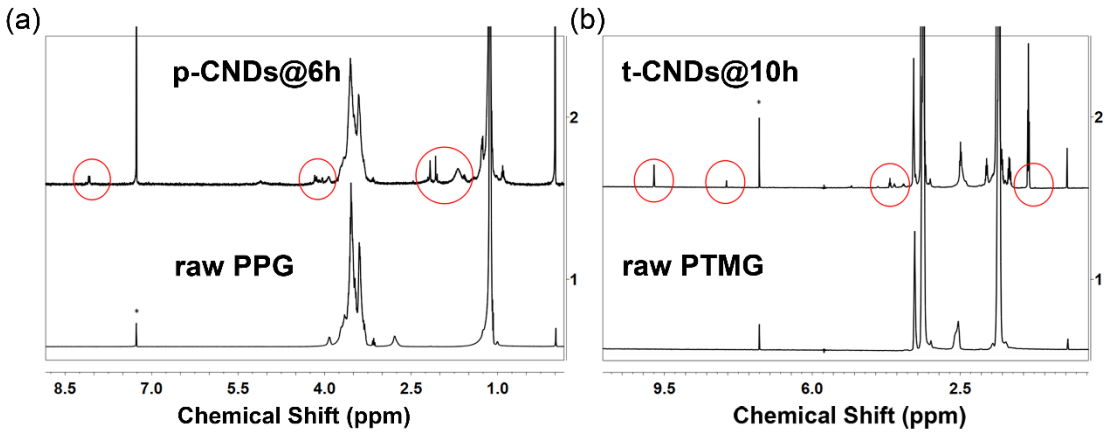


Fig. S5 ^{1}H NMR spectra of CNDs from (a) PPG and (b) PTMG.

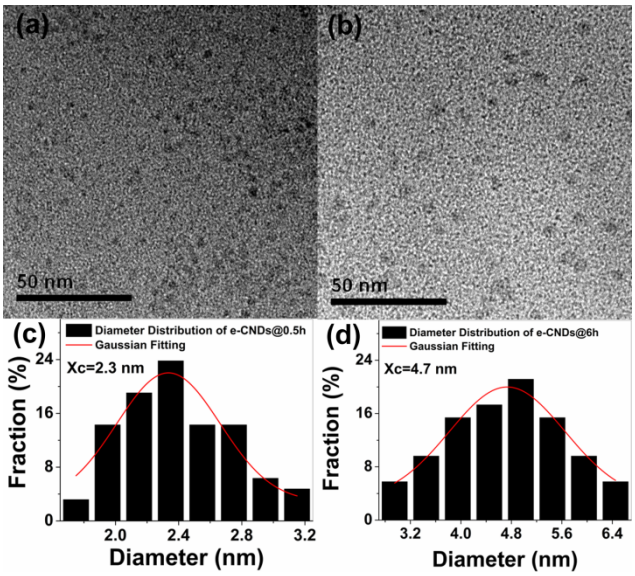


Fig. S6 TEM images of (a) e-CNDs@0.5h and (b) e-CNDs@6h; Diameter distribution of (c) e-CNDs@0.5h and (d) e-CNDs@6h, the red line is the Gaussian fitting curve.

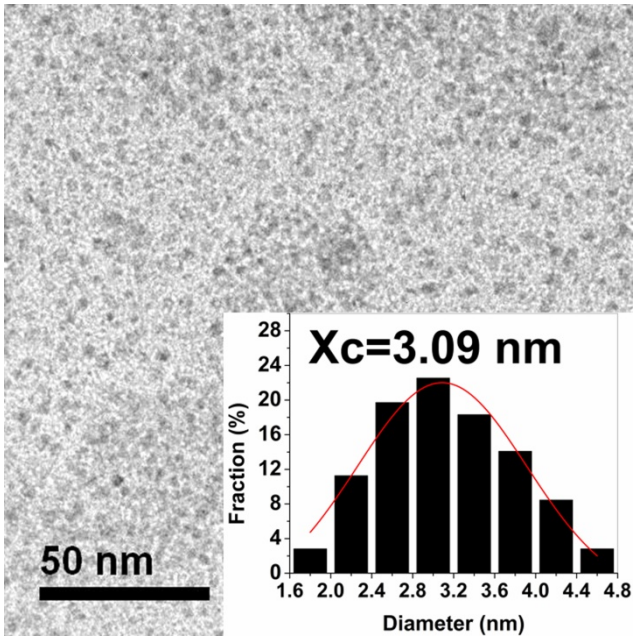


Fig. S7 TEM images of e-PAHs-CNDs@2h, inset image: diameter distribution of e-PAHs-CNDs@2h (the red line is the Gaussian fitting curve).

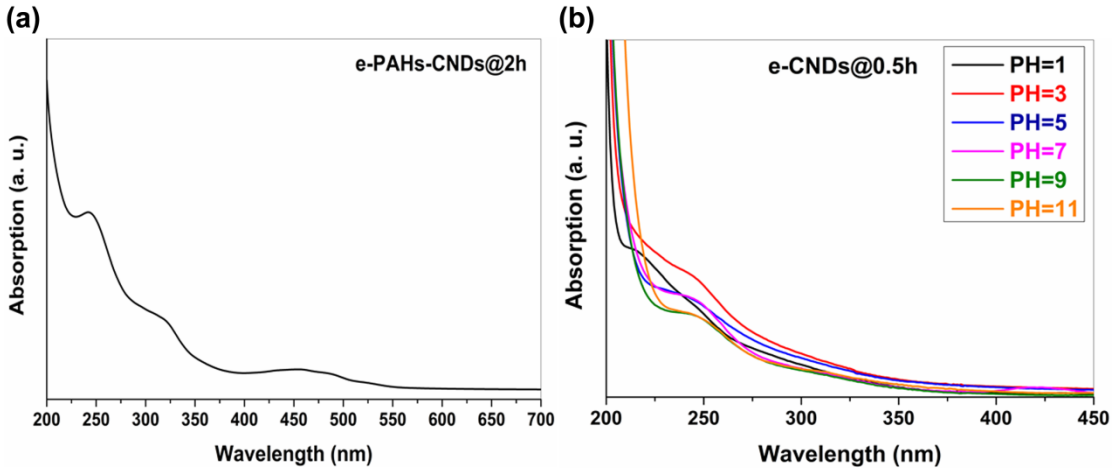


Fig. S8 UV-vis spectra of (a) e-PAHs-CNDs@2h and e-CNDs@0.5h at different pH varied from 1 to 11.

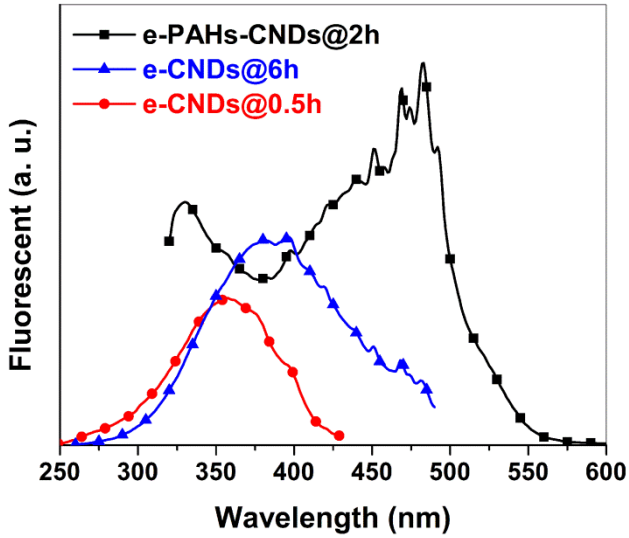


Fig. S9 Fluorescence excitation spectra of CNDs (red: e-CNDs@0.5h, blue: e-CNDs@6h, black: e-PAHs-CNDs@2h).

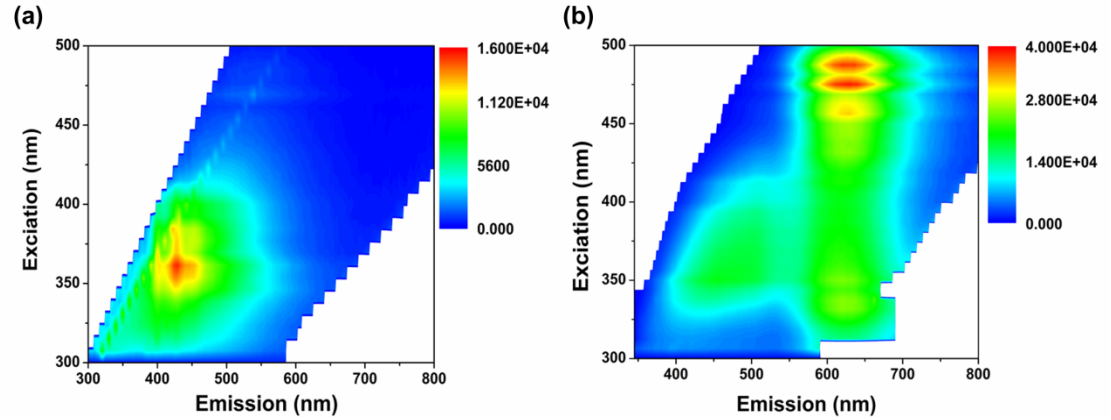


Fig. S10 2D-fluorescence topographical map of CNDs. (a) e-CNDs@0.5h and dispersed in toluene, (b) e-PAHs-CNDs@2h and dispersed in water.

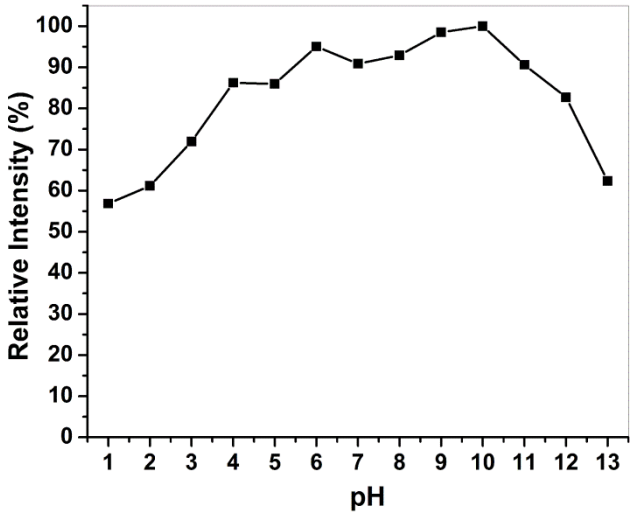


Fig. S11 (a) Effect of pH on the fluorescence intensity at 450 nm (at 360 nm excitation).

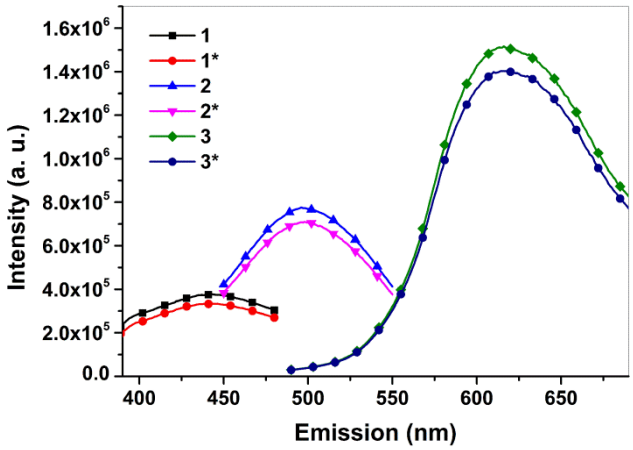


Fig. S12 PL spectra of CNDs. 1: e-CNDs@0.5h, 2: e-CNDs@6h, 3: e-PAHs-CNDs@2h, corresponding 1*, 2* and 3*: samples storaged in the ambient environment for 1 month. (e-CNDs@0.5h, e-CNDs@6h, e-PAHs-CNDs@2h were excitated at 360 nm, 390 nm and 470 nm, respectively.)

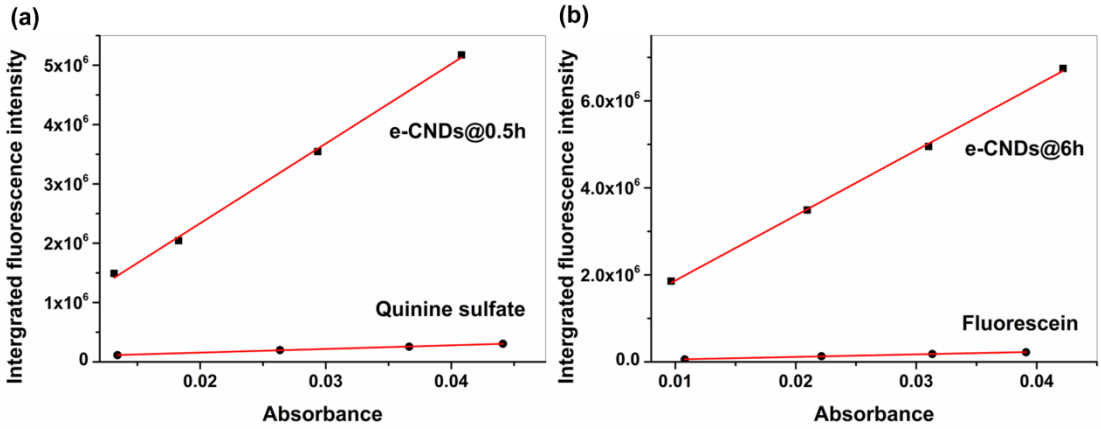


Fig. S13 Integrated fluorescence intensity versus absorbance plot CNDs and references. (a) e-CNDs@0.5h and quinine sulfate solution; (b) e-CNDs@6h and fluorescein solution.

Table S1 The value of quantum yields of CNDs.

	M	R	Φ
Quinine sulfate	1.34E+08	0.997	55
e-CNDs@0.5h	6.15E+06	0.998	2.51
Fluorescein	1.50E+08	0.999	93
e-CNDs@6h	5.83E+06	0.996	3.58