Electronic Supplementary Information

Shifting and Non-Shifting Fluorescence Emitted by Carbon Nanodots

Yan-Min Long, Chuan-Hua Zhou, Zhi-Ling Zhang, Zhi-Quan Tian, Lei Bao, Yi Lin and Dai-Wen Pang*

1. Preparation of carbon paste electrodes

Two kinds of carbon pastes were prepared by thoroughly mixing the conductive carbon black (Vulcan XC72, Cabot) and liquid olefin at mass (g)/volume (mL) ratios of 6:4 and 7:3, respectively. And the mass factions of carbon black in resultant carbon pastes were 64% and 73%, respectively. The carbon paste electrodes were prepared by firmly filling the corresponding carbon paste into 10 μL pipet tip of a fixed length after cutting off the head and tail parts, with the slimmer end inserted by a length of Pt wire for the electrical contact and the other end as a disk surface. The disk surface of the electrode was polished on a piece of weighing paper and then rinsed prior to use.

2. Charging current measurement of carbon paste electrodes

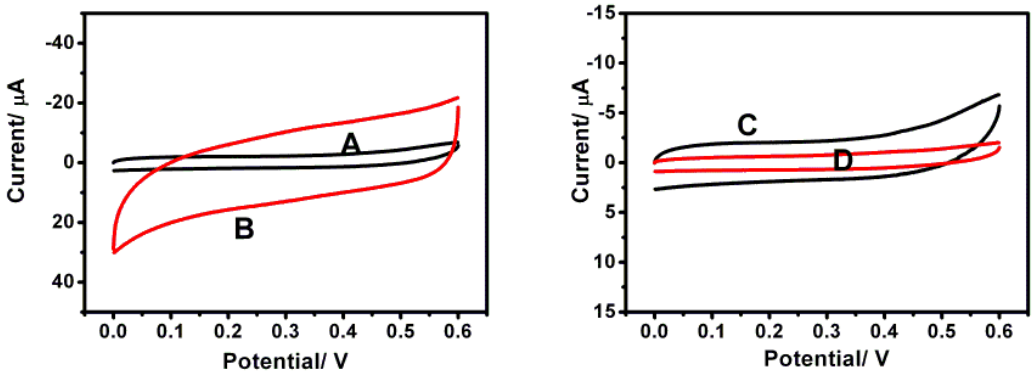

Fig. S1 Cyclic voltametry of 64% carbon paste electrode in 0.1 M NaH_2PO_4 aqueous solution before (A) and after 1h electro-oxidation (B). Cyclic voltametry of the pristine 64% (C) and 73% (D) carbon paste electrode, respectively.

3. Statistical size distribution based on TEM data

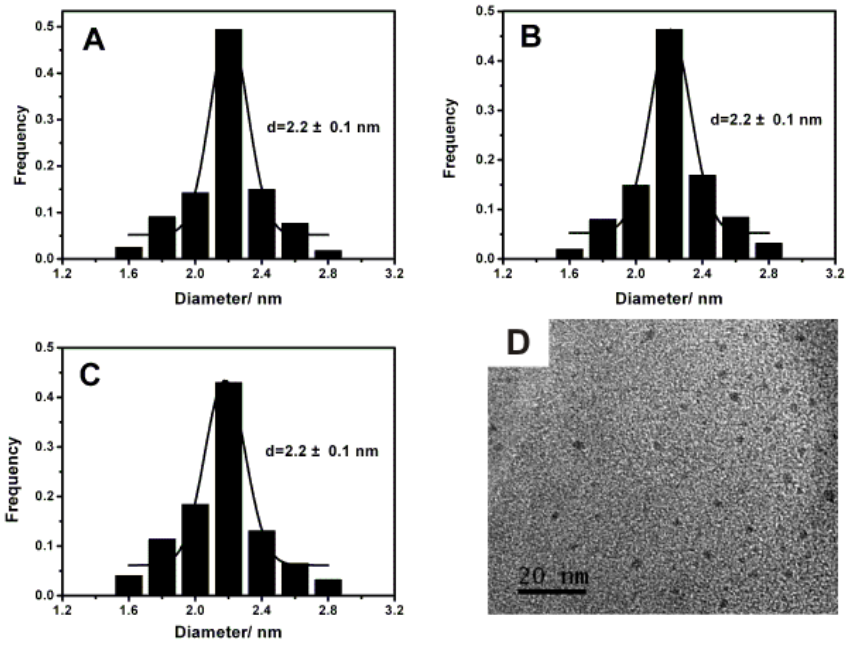

Fig. S2 Statistical size distributions of 64% C-dots (A), 73% C-dots (B) and 73% C-dots after electro-oxidation at +1.5V (C). TEM image of the electro-oxidized 73% C-dots (D). The statistical results were given based on sizes of more than 200 C-dots in each sample.

4. Zeta potential of C-dots

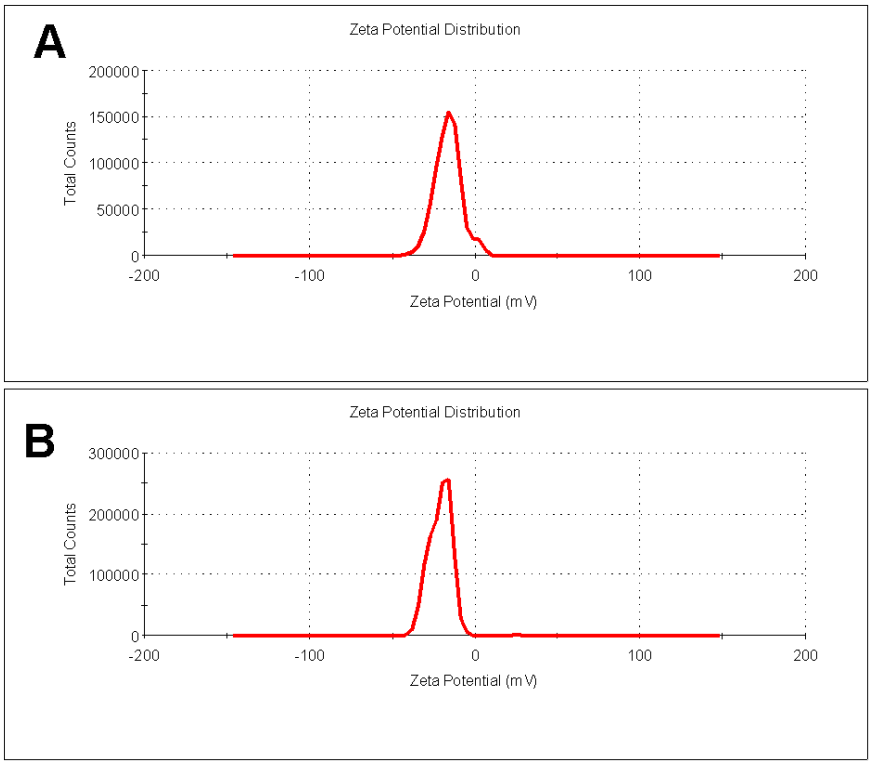

Fig. S3 Zeta potential of 73% C-dots (A) and 64% C-dots (B).

5. Typical fluorescence decay of the C-dots

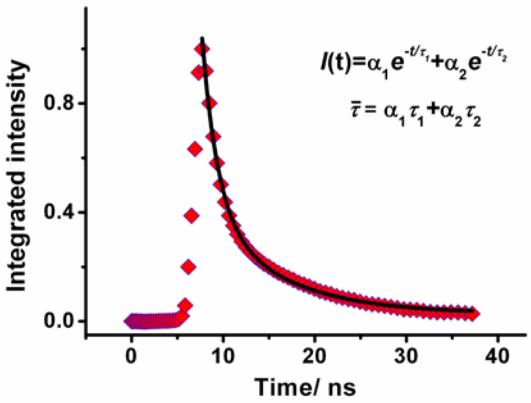

Fig. S4 Fluorescence decay curve of 64% C-dots recorded at the emission wavelength of 500 nm with the excitation of 337 nm.

6. Photostability of C-dots

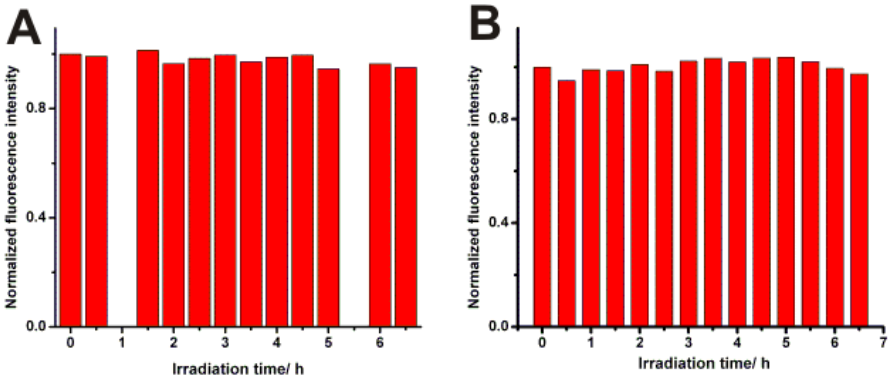

Fig. S5 Effect of continuous irradiation with an ultraviolet light on the fluorescence intensity of 64% C-dots (A) and 73% C-dots (B). The fluorescence intensity was collected at the maximum emission wavelength.

7. Cytotoxicity assay and cell labeling

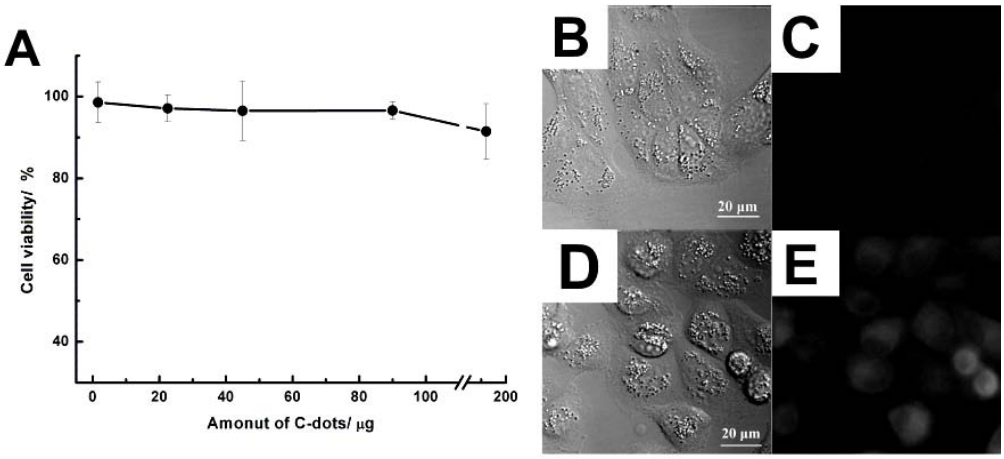

Fig. S6 Effect of the 64% C-dots on human A549 cells (human lung carcinoma epithelial cells) viability (A) and confocal images of MDCK cells with (D, E) and without (B, C) internalized 64% C-dots under bright field (B, D) and fluorescent field (C, E). The cell imaging experiment was conducted as follows. MDCK cells were incubated in petri dish at 37

ºC until confluence was reached and then 500 μL C-dots solution mixed with 1mL culture medium was added into the petri dish. After incubation with C-dots for 2 hours, MDCK cells in the petri dish were washed with 1×PBS for three times and kept in 1×PBS for cell imaging.

8. The area percentages of deconvoluted peaks in C1s XPS spectra

Table S1. The summarized data of area percentages of resolved peaks in total C1s XPS spectra of three samples

sample	**C-C (area %)**	**C-O (area %)**	**C=O (area %)**	**O-C=O (area %)**
64% C-dots	59.7	17.2	11.1	12.0
73% C-dots	74.2	11.7	10.2	3.8
EO-73% C-dots[a]	64.0	16.7	15.6	3.7

[a] EO-73% C-dots stands for the electro-oxidized 73% C-dots