Electronic Supplementary Information

Analytical Methods

Photoelectrochemical-assisted determination of caffeic acid exploiting a composite based carbon nanotubes, cadmium telluride quantum dots, and titanium dioxide

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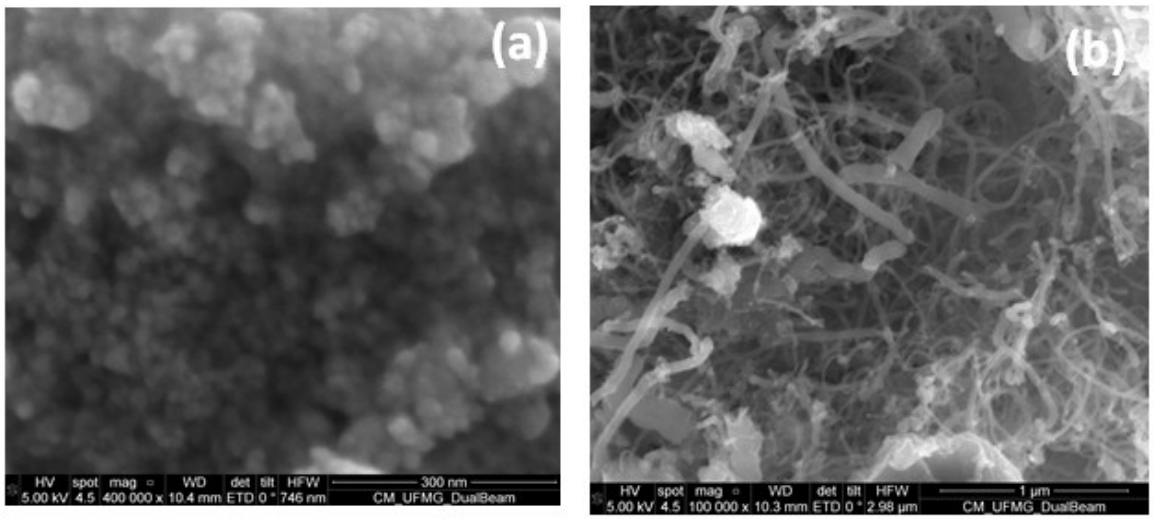

Figure S1: SEM images for: (a) TiO_2 nanoparticles 300 nm; (b) carbon nanotubes 1 µm.

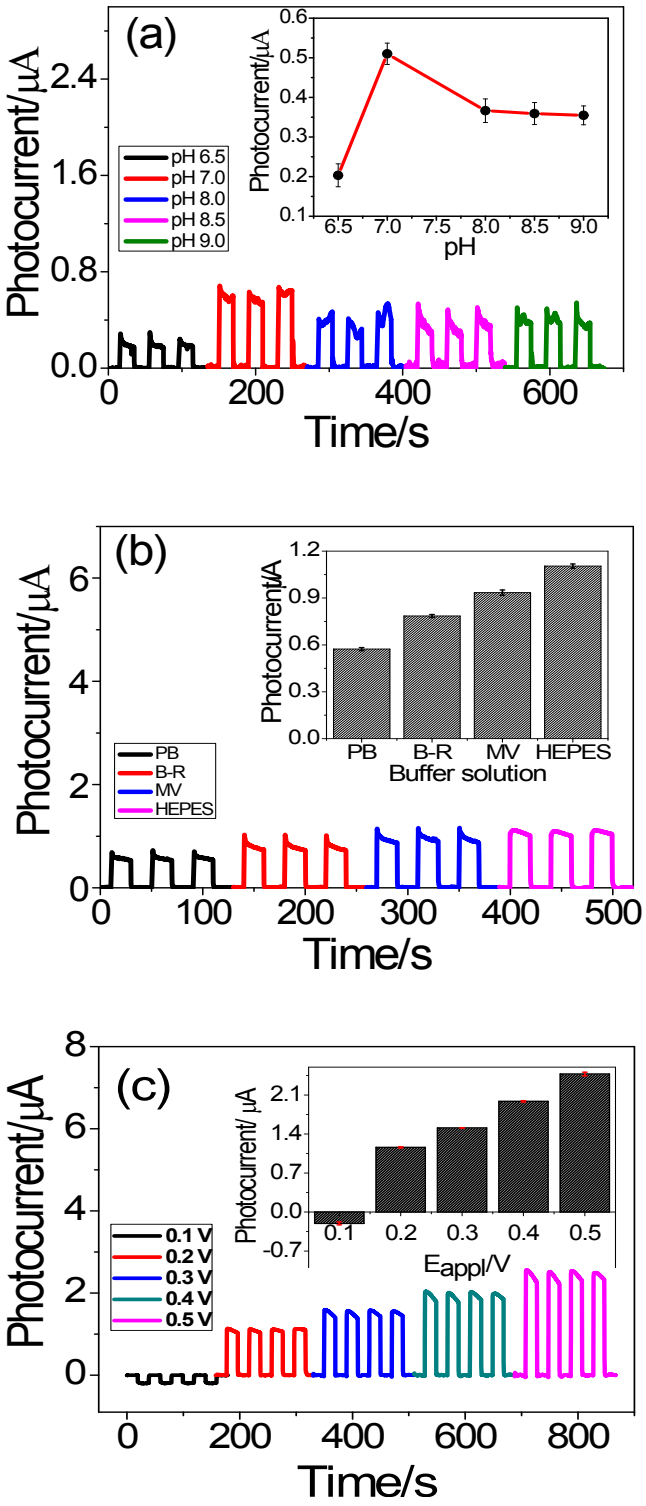

Figure S2: Photoelectrochemical response to TiO_2/CNTs/CdTeQDs/FTO in different: pH values (a); different buffer solutions (b) ($E_{appl.}$=+0.2 V vs. Ag/AgCl); applied potential (c). Inserted figures: Photocurrent plot in function of analytical parameters. [CA]=200 μmol L^{-1}.

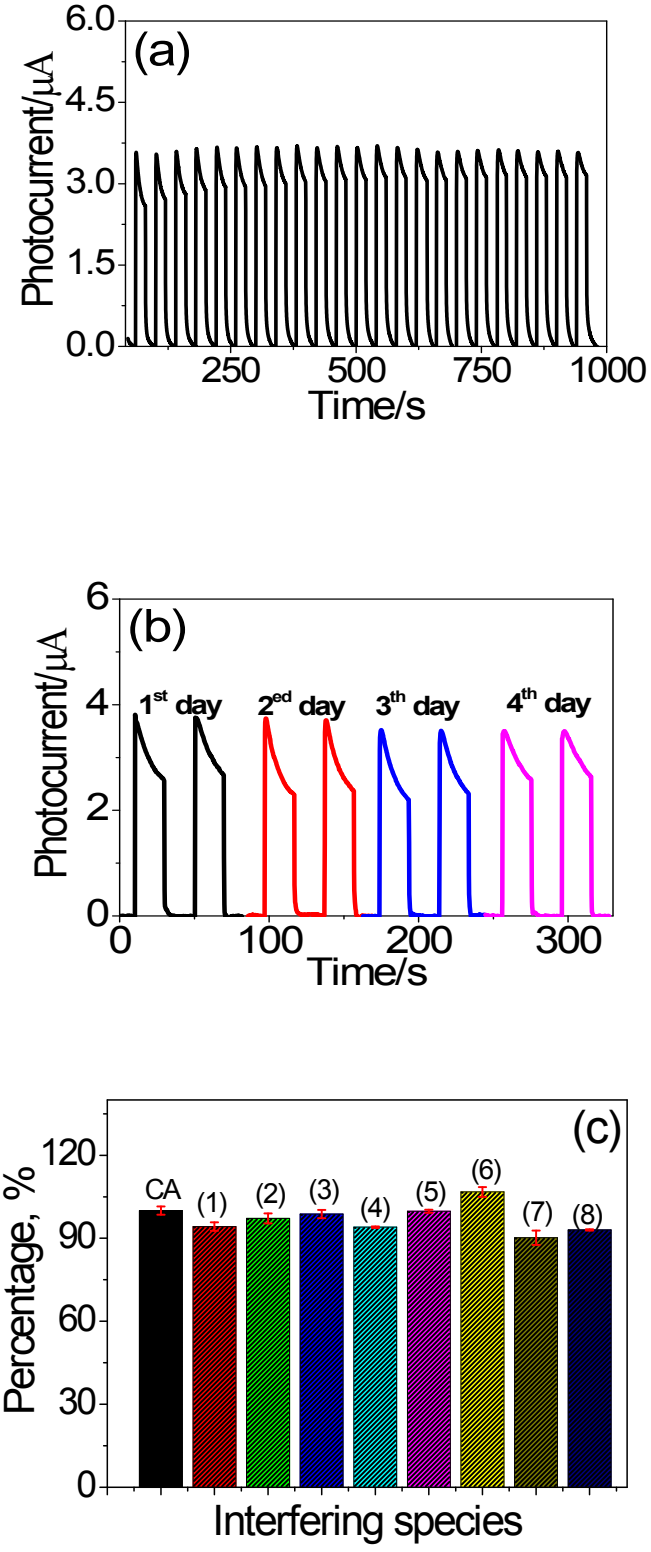

Figure S3: Photoelectrochemical response to TiO_2/CNTs/CdTeQDs/FTO in the presence of CA obtained: (a) on the same day; (b) on different days; and (c) influence of interfering compounds on the photoelectrochemical response of the sensor. All the experiments were performed in 0.1mol.L^{-1} HEPES buffer, pH 7.0. E_{appl} = +0.4 V vs Ag AgCl. (1) chlorogenic acid; (2) ascorbic acid; (3) tartaric acid; (4) gallic acid; (5) quercetin; (6) caffeic ethyl ester.; (7) vanillic acid; (8) ferulic acid.

Table S1: Comparison of analytical parameters obtained by different analytical methods for CA determination.

Analytical Method	Linear range /µmol L^{-1}	LOD/µmol L^{-1}	LOQ/µmol L^{-1}	Reference
PEC	0.2–110.51 (DPV) 110.51–482 (DPV) 1–520 (amperometry)	0.13 0.76	-	3
HPLC	5.55–555	1.11	3.33	5
HPLC	0.048-277	0.014	0.048	6
UV-vis Spectroscopy	0.88–555	13	44	7
Capillary Electrophoresis	11.1–555	2.70	9.44	9
Capillary Electrophoresis	2.77–416	0.27	0.5	10
HPLC	1.4-21.6	0.15	0.5	31
HPLC-UV	55.5- 333	7.9	24.3	32
HPLC-UV-vis	0.55-138	0.17	0.58	33
Fluorometry	0.5–200	0.11	-	34
Fluorometry	2–350	0.20	-	35
Fluorometry	0.14–1.4	0.06	-	36
Fluorometry	3.71–111.8	1.20	-	37
PEC	0.50–360 (amperometry)	0.15	0.44	This work