Electronic Supplementary Material (ESI) for Analytical Methods.

Electrocatalytic oxidation of N–acetyl–L–cysteine at quercetin multiwall carbon nanotubes modified GCE: Application for simultaneous determination of ascorbic acid, L–DOPA, N–acetyl–L–cysteine, acetaminophen and tryptophan

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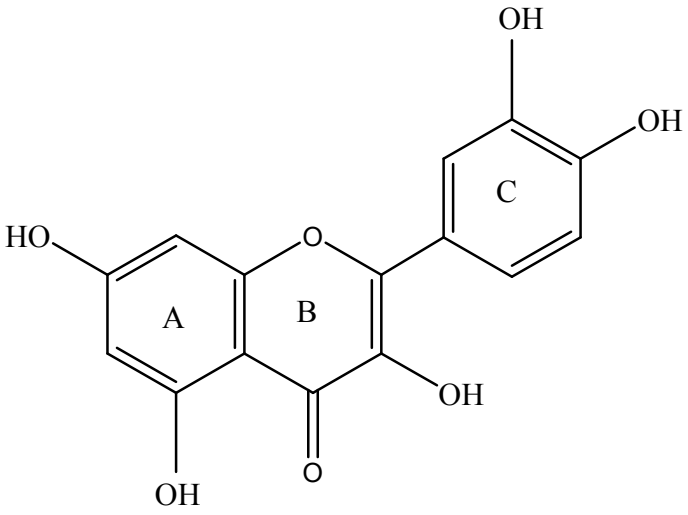

Scheme S1. The molecular structure of quercetin.

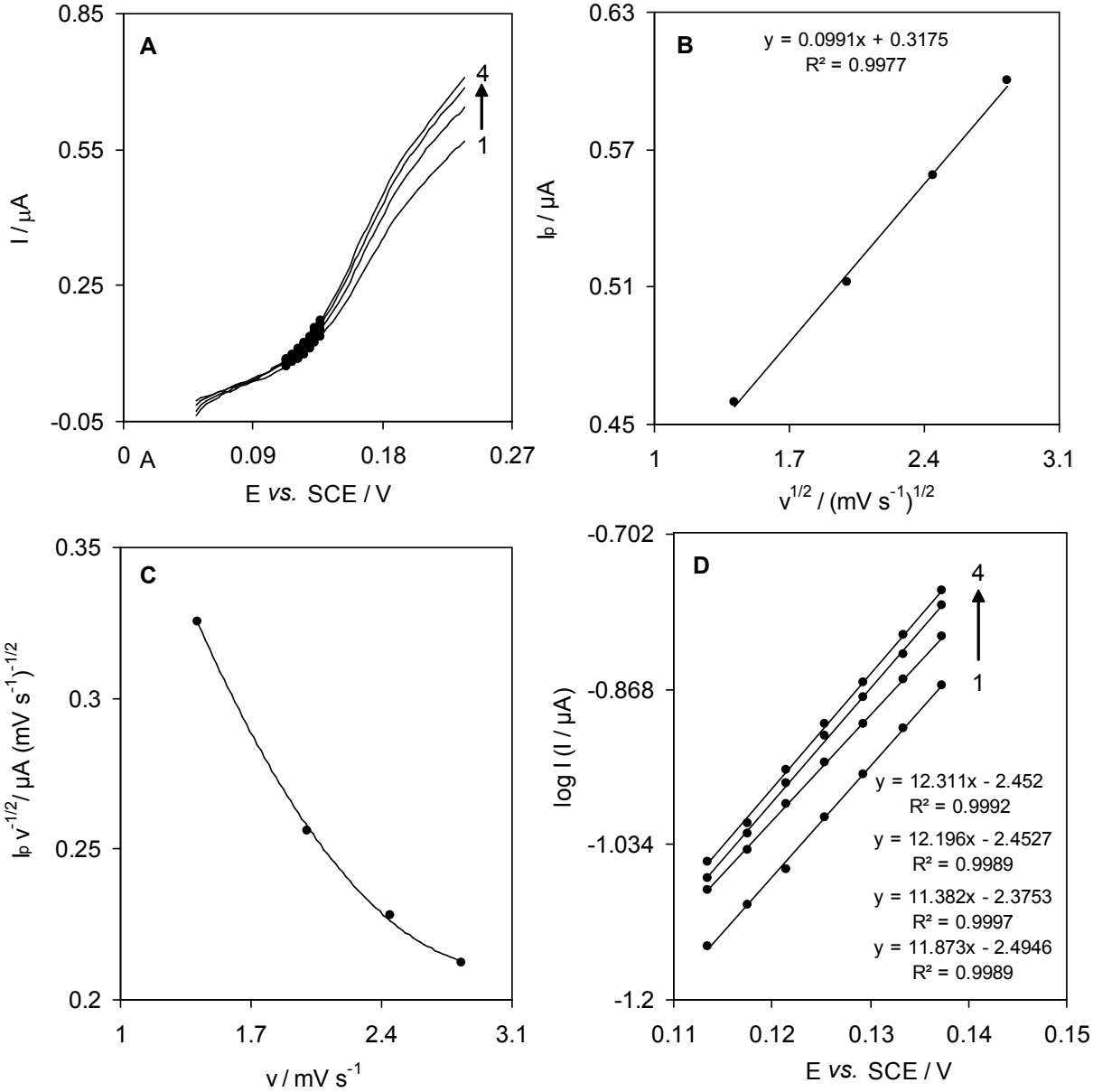

Fig. S1. (A) Linear sweep voltammograms of Q–MWCNT–GCE in a 0.10 M phosphate buffer solution (pH 7.0) containing 0.20 mM NAC at different potential scan rates. Numbers of 1–4 correspond to 2, 4, 6 and 8 mV s^{-1}, respectively. (B) Variation of the electrocatalytic peak current *vs.* the square root of the potential scan rate. (C) Variation of the sweep rate normalized peak current ($I_p\, v^{-1/2}$) *vs.* the potential scan rate. (D) Tafel plots drawn from the linear sweep voltammograms of (A). Equations from bottom to top correspond to plots of 1–4, respectively.

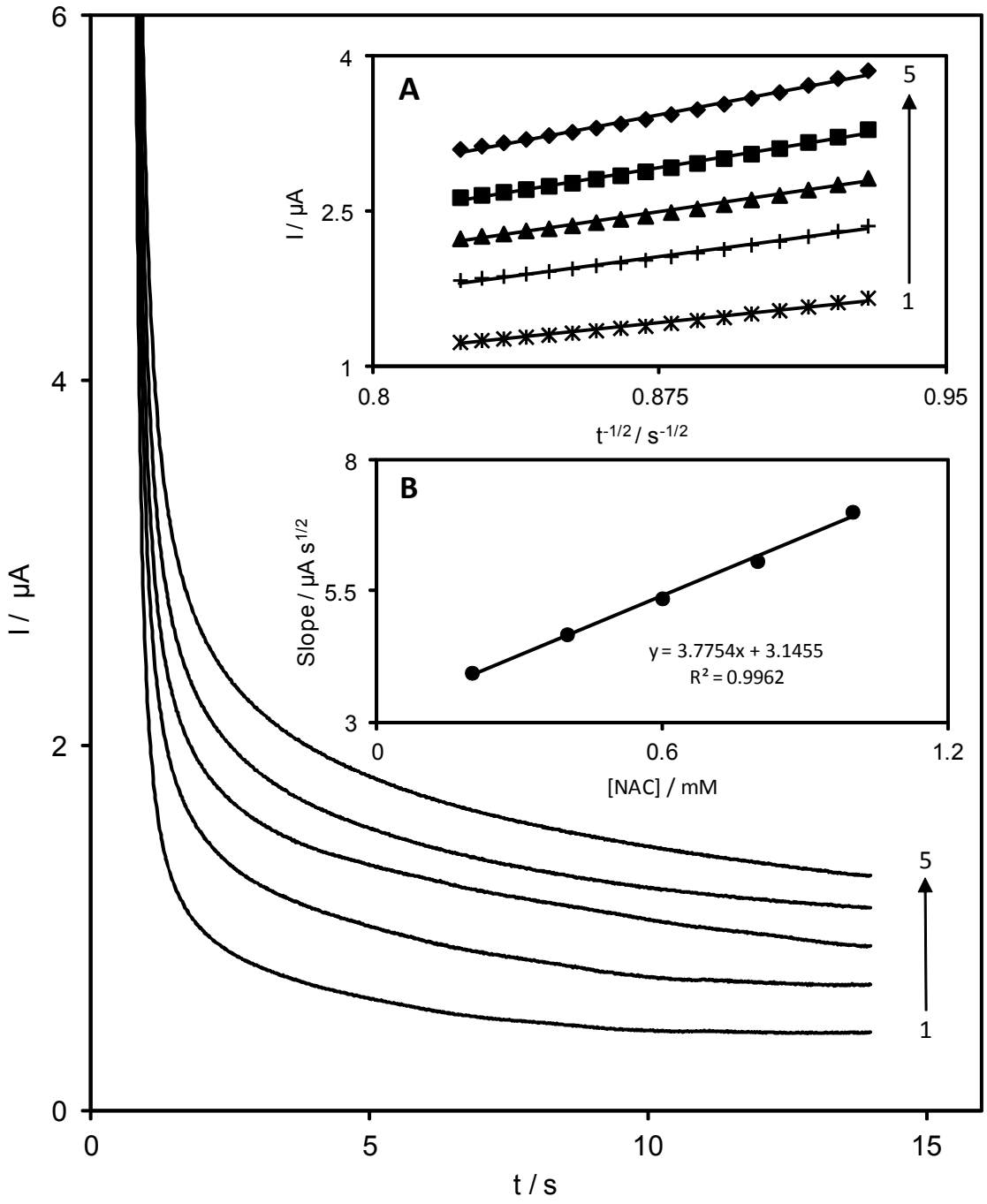

Fig. S2. Chronoamperometric responses of Q–MWCNT–GCE in a 0.10 M phosphate buffer solution (pH 7.0) at a potential step 250 mV for different concentrations of NAC. Numbers of 1–5 correspond to 0.2–1.0 mM NAC. Insets: (A) plots of I *vs.* $t^{-1/2}$ obtained from chronoamperograms. (B) Plot of the slope of straight lines against the NAC concentrations.

Table S1. Comparison of the analytical parameters of several modified electrodes for NAC electrocatalytic determination

Modified electrode[a]	Method	Linear range (μM)	Detection limit(μM)	References
AC/RuON/GCE	DPV	0.3–14.0 14.0–1000.0	2.84	[1]
PB/Pd–Al	Amperometry	2.0–40.0	0.54	[15]
CuHCF/CPE	DPV	120.0–830.0	63.0	[40]
Catechol/CPE	CV	80.0–1000.0	60.0	[41]
Nq/NG/PDC/GCE	DPV	4.0–130.0	0.80	[42]
Edge plane pyrolytic graphite electrode	CV	5.0–110.0	1.70	[43]
Fe(II)NP/CPE	Amperometry	960.0–14.000	150.0	[44]
Fe_2O_3@CoHCF/CPE	Amperometry	20.0–432.0	0.0209	[45]
Cobalt salophen complexes/CPE	DPV	0.10–100.0	0.05	[46]
N–DHPB/MWCNT/CPE	DPV	0.50–200.0	0.20	[47]
CoNPs–CNFs/GCE	Amperometry	0.12–13.3	25.0	[48]
Q–MWCNT–GCE	DPV	1.1–50.0 50.0–1000.0	0.44	This work

[a]AC–RuON–GCE: Acetaminophene at the surface of a ruthenium oxide nanoparticles–glassy carbon electrode; PB/Pd–Al: Palladized aluminum electrode modified by prussian blue film; CuHCF/CPE: Carbon paste electrode modified with copper (II) hexacyanoferrate (III); Catechol/CPE: Carbon paste electrode modified with catechol; Nq/NG/PDC/GCE: Nanocomposite containing naphthoquinone and nanogold supported on poly (2,6–pyridinedicarboxylic acid) film modified glassy carbon electrode; Fe(II)NP/CPE: Iron nitroprusside modified graphite paste electrode; Cobalt salophen complexes/CPE: Carbon nanotube–paste electrode modified with salophen complexes of cobalt(III) perchlorate; Fe_2O_3@CoHCF/CPE: Nanoparticles of iron (III) oxide core–cobalt hexacyanoferrate shell (Fe_2O_3@CoHCF)–modified carbon paste electrode; *N*–DHPB/MWCNT/CPE: *N*–(3,4–dihydroxyphenethyl)–3,5–dinitrobenzamide modified multiwall carbon nanotubes paste electrode; CoNPs–CNFs/GCE: Carbon nanofibers (CNFs) decorated with cobalt nanoparticles (CoNPs)–glassy carbon electrode; Q–MWCNT–GCE: Quercetin modified multiwall carbon nanotubes–glassy carbon electrode.