

Electrodeposition of Cobalt Oxides on Carbon Nanotubes for Sensitive Bromhexine Sensing

Sireerat Lisnund ^{1,*}, Vincent Blay ², Pratchaya Muamkhunthod ¹, Kittiya Thunyanon ¹, Jaruwan Pansalee ³, Jirawan Monkrathok ⁴, Pachara Maneechote ⁴, Kantapat Chansaenpak ⁵ and Piyanut Pinyou ^{3,*}

¹ Department of Applied Chemistry, Faculty of Science and Liberal Arts, Rajamangala University of Technology Isan, Nakhon Ratchasima 30000, Thailand; mpratchaya28@gmail.com (P.M.); kittiya.28082556@gmail.com (K.T.)

² Department of Microbiology and Environmental Toxicology, University of California Santa Cruz, Santa Cruz, CA 95064, USA; vroger@ucsc.edu

³ School of Chemistry, Institute of Science, Suranaree University of Technology, Nakhon Ratchasima 30000, Thailand; jaruwon.pa2565@gmail.com

⁴ Institute of Research and Development, Suranaree University of Technology, Nakhon Ratchasima 30000, Thailand; jirawanp5414@gmail.com (J.M.); pachara.ma@sut.ac.th (P.M.)

⁵ National Nanotechnology Center, National Science and Technology Development Agency, Thailand Science Park, Pathum Thani 12120, Thailand; kantapat.cha@nanotec.or.th

* Correspondence: sireerat.in@rmuti.ac.th (S.L.); piyanutp@sut.ac.th (P.P.)

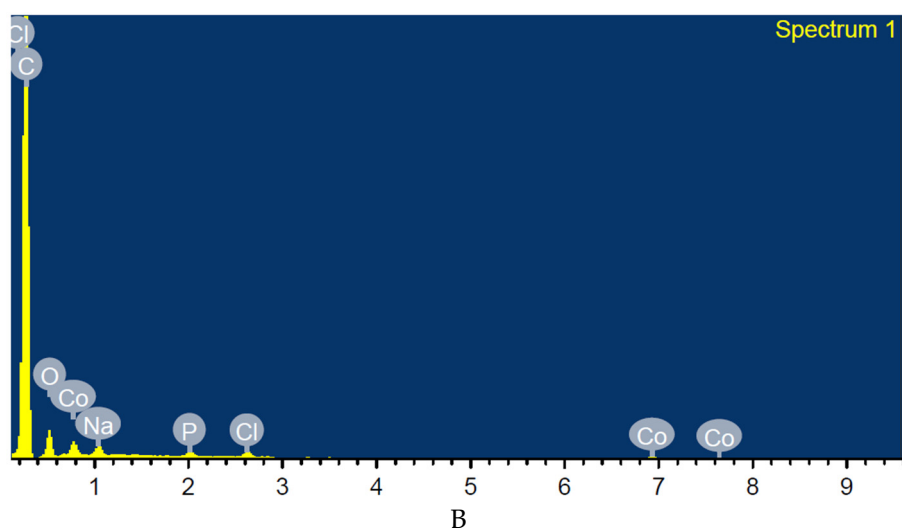
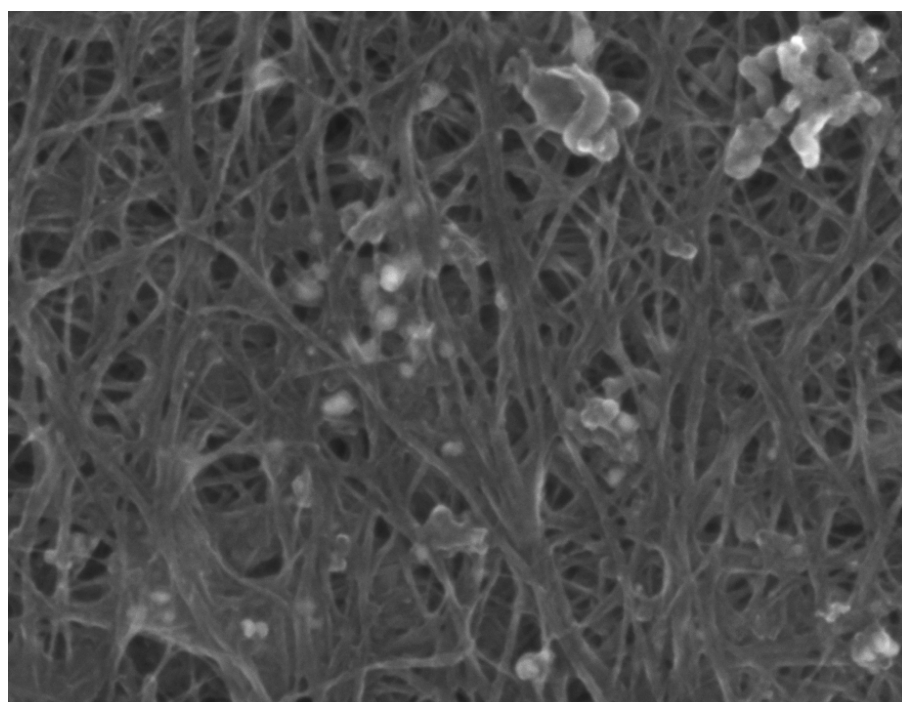


Figure S1. (A) SEM-image of CoO_x/SWCNT/GCE and (B) its SEM-EDX spectrum of CoO_x particles on the SWCNT/GCE.

Table S1. EDX analysis of the CoO_x/SWCNT/GCE .

Element	Series	%Weight	%Atomic
C	K	82.82	90.69
O	K	8.17	6.72
Na	K	0.90	0.52
P	K	0.61	0.26
Cl	K	0.95	0.35
Co	L	6.54	1.46

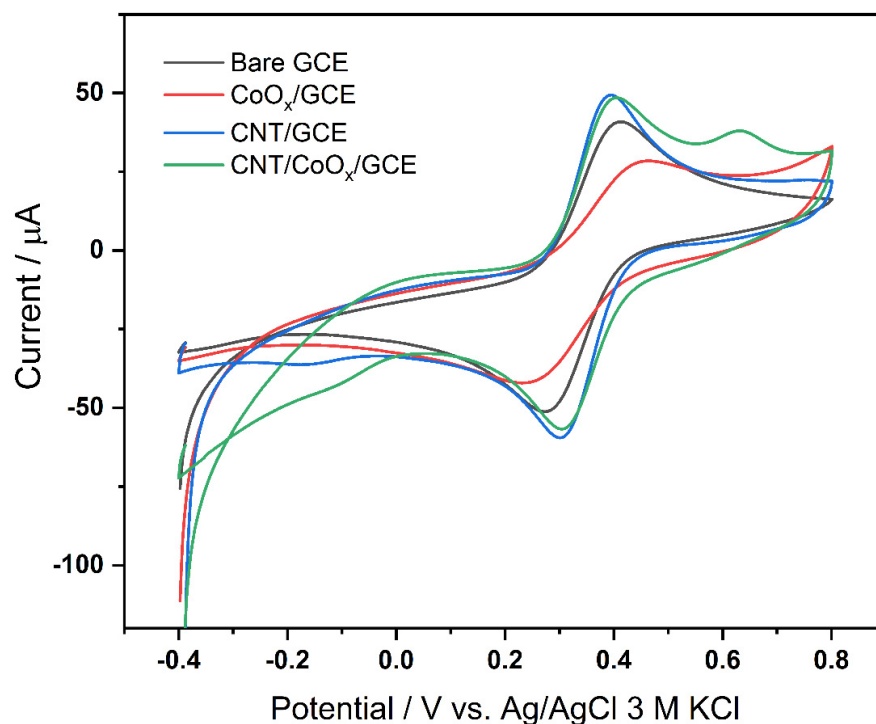


Figure S2. Cyclic voltammograms of the GCE with different modifications in 5 mM $K_3[Fe(CN)_6]$ containing 0.1 M KCl at the scan rate of 50 mV/s.

Table S2. Comparison of the electroactive surface area for the electrode with different modifications estimated from CV in 5 mM $K_3[Fe(CN)_6]$ containing 0.1 M KCl.

Electrode	Electroactive Surface Area (cm ²)
Bare GCE	0.0580
CoO _x /GCE	0.0345
SWCNT/GCE	0.0682
CoO _x /SWCNT/GCE	0.0637

Table S3. Effect of interfering substances on the current response for BHC determination (50 μM) using the CoO_x/SWCNT/GCE.

Substance	Concentration (mM)	%Deviation
NH ₄ Cl	5	-1.43
MgCl ₂	5	-3.21
KNO ₃	5	-4.16
glucose	5	-0.42
sucrose	5	-2.72
ribose	5	-5.43
caffeine	5	-6.20