Supporting Information

Core-shell Structured Co_3O_4@PPy Composite for Electrochemical Determination of Tertbutylhydroquinone

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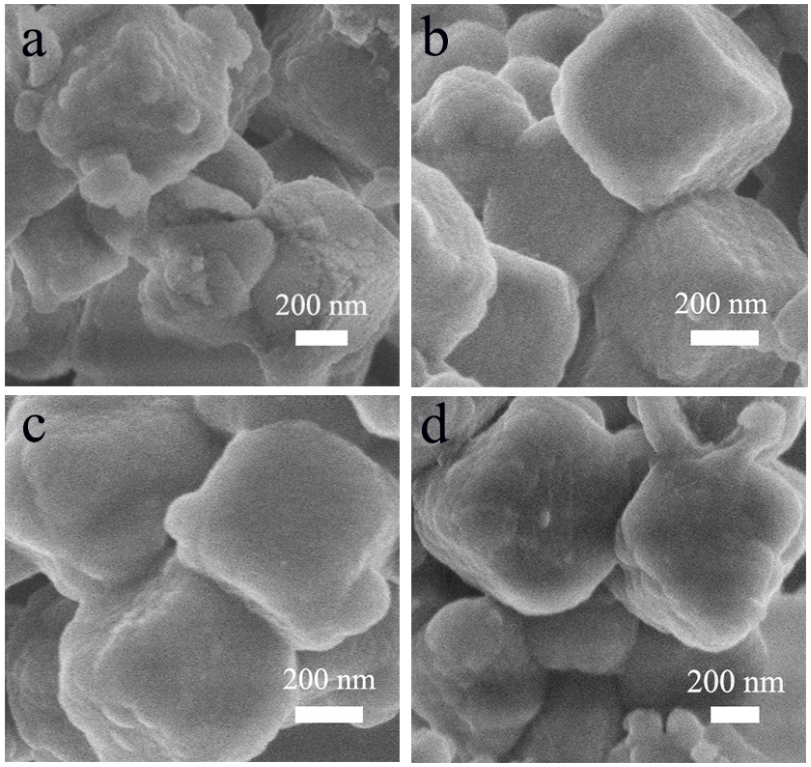

Figure S1. SEM images of Co_3O_4@PPy synthesized with various volume of Py monomer 6 μL (a), 12 μL (b), 18 μL (c), 24 μL (d).

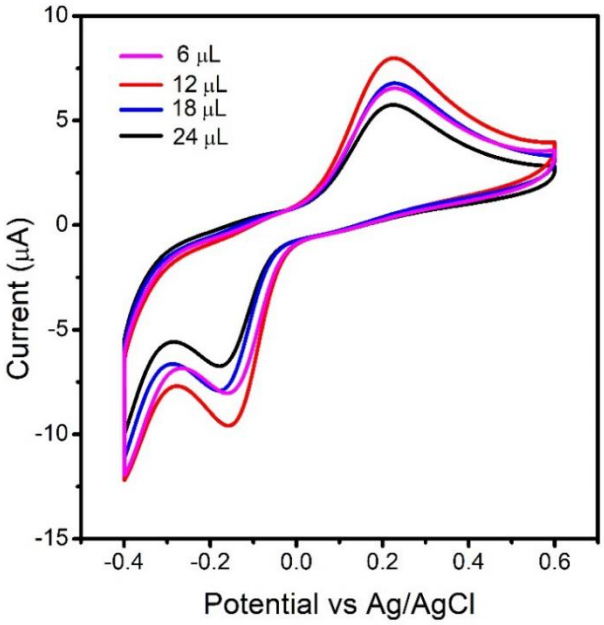

Figure S2. CVs of Co_3O_4@PPy in 0.1 M PBS (pH 7.0) containing 100 μM TBHQ with 6 μL, 12 μL, 18 μL, 24 μL Py monomer.

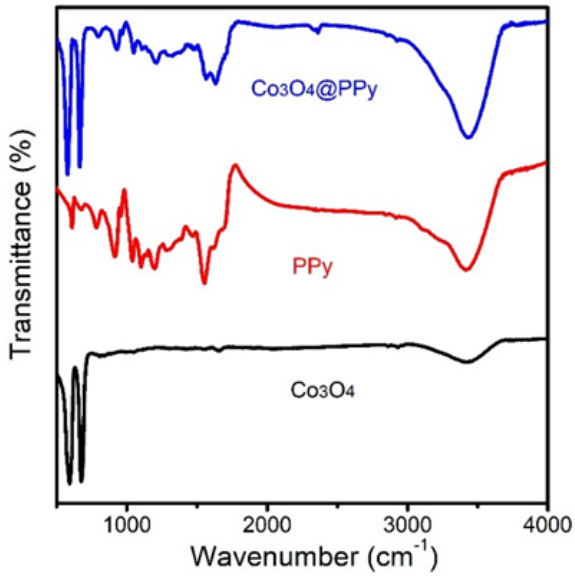

Figure S3. FT-IR spectrum of Co_3O_4, PPy and Co_3O_4@PPy.

Table S1. Attributions of characteristic peaks on the FT-IR spectrum of Co_3O_4@PPy.

Wave number (cm^{-1})	Mode of vibration	Reference
669	Co-O	[28]
572		[28]
792	the presence of polymerized pyrrole	[29]
927	=C−H out-of-plane of polypyrrole	[30]
1045	N−H in-plane deformation of H^+-doped polypyrrole	[29]
1109	C−N stretching	[31]
1315	C−H in-plane	[31]
1554	symmetric pyrrole ring-stretching	[33]
1465	C=C and C-N stretching of pyrrole ring	[32]
1640		[30]
3423	O−H stretching vibration	[34]

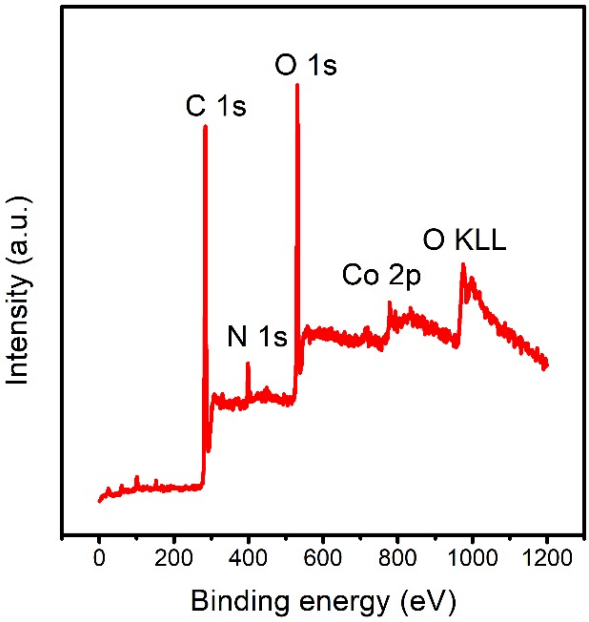

Figure S4. XPS survey spectrum of Co_3O_4@PPy.

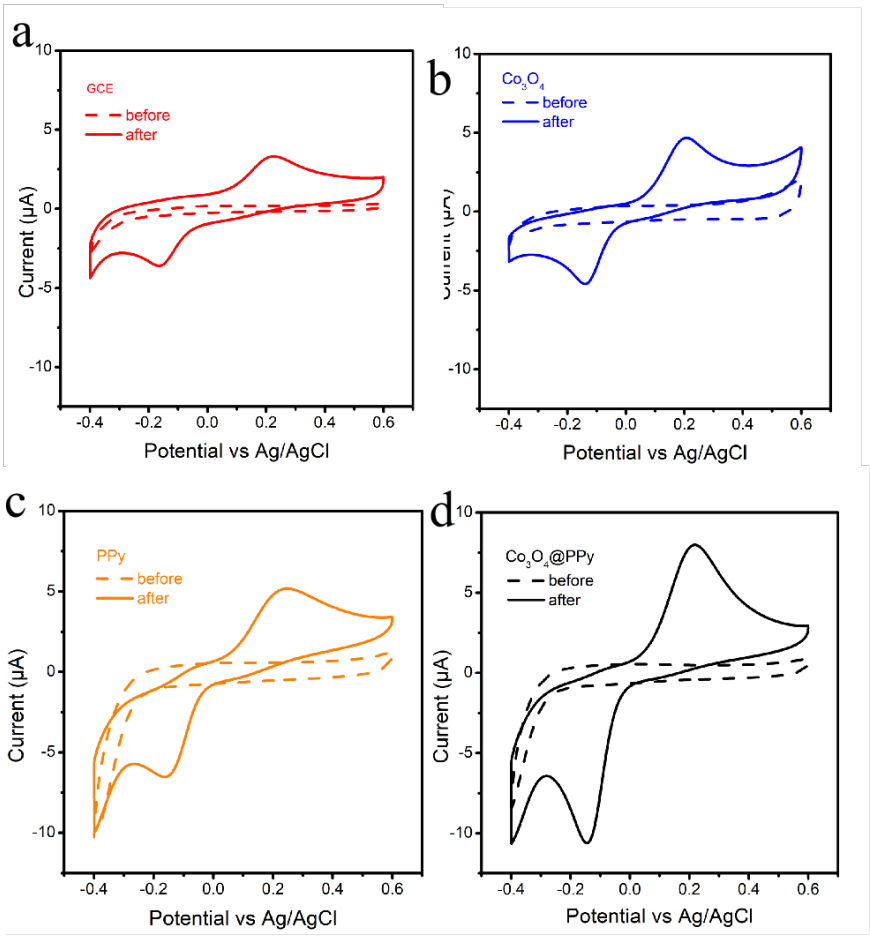

Figure S5. CVs of (a) GCE (b) Co_3O_4 (c) PPy (d) Co_3O_4@PPy before(dotted) and after(solid) adding 100 μM TBHQ in 0.1 M PBS (pH = 7).

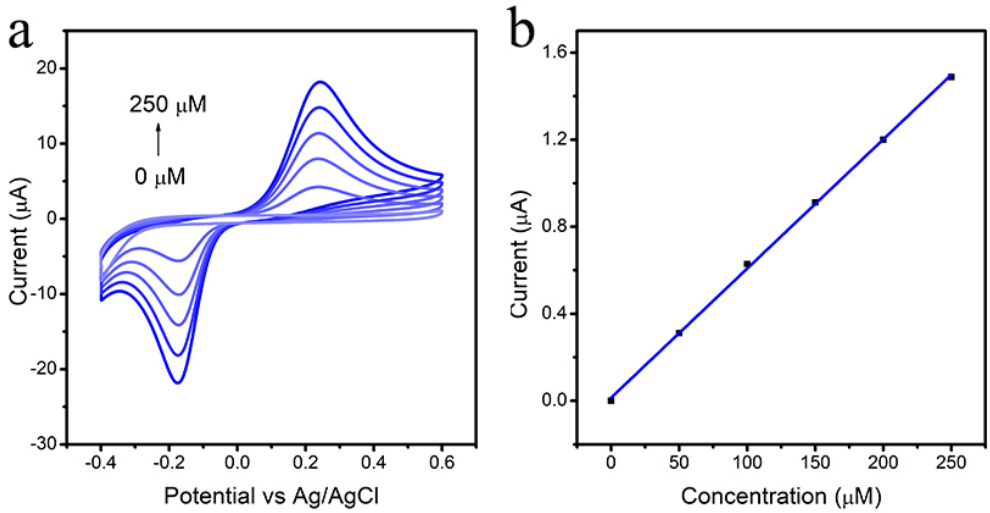

Figure S6. (a) CVs of Co_3O_4@PPy/GCE in 0.1 M PBS (pH = 7) containing individual concentrations of TBHQ (0, 50, 100, 150, 200, 250). (b) Corresponds to a linear relationship between TBHQ concentrations and current response.

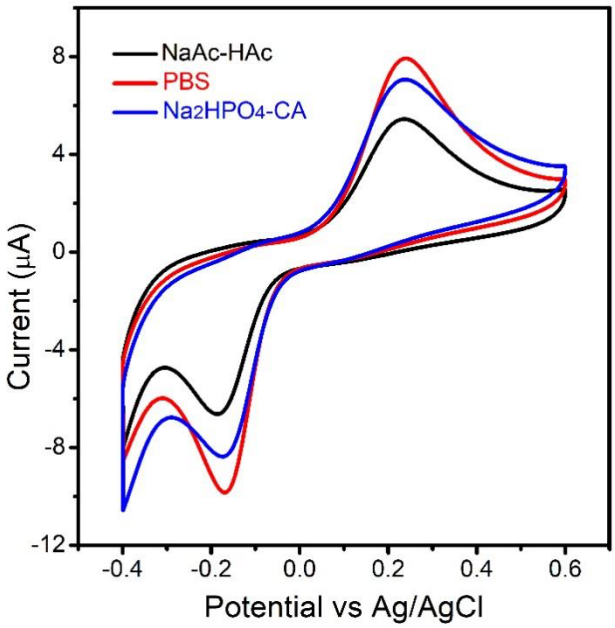

Figure S7. CVs of Co_3O_4@PPy/GCE in different buffer solution containing 100 μM TBHQ.

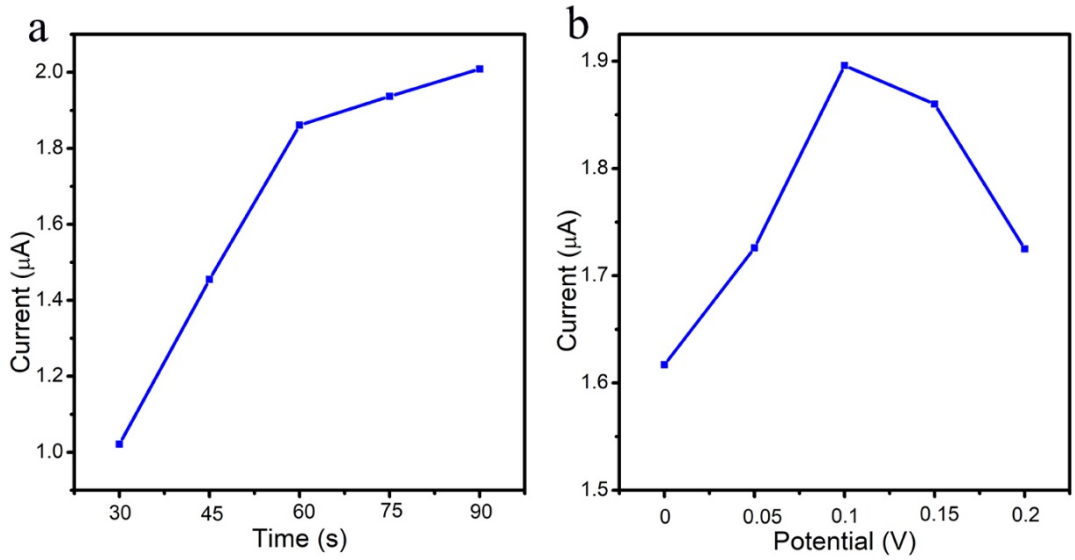

Figure S8. The effects of accumulation time (a) and accumulation potential (b) on the oxidation current of 100 μM TBHQ in 0.1 M PBS solution (pH 7.0).

Table S2. Comparison of TBHQ test with previous literature

Electrode materials	Linear range (μM)	LOD (μM)	References
MIP/ZC/GCE	1-75	0.42	[8]
PdAuNPs/ERGO/GCE	3-360	0.28	[6]
Zn TPHS@GO/GCE	0.80–65	0.137	[36]
Poly(methacrylic acid-hemin)-MWNT/GCE	2.84-150	0.85	[7]
Co_3O_4@PPy/GCE	0.2-600	0.05	This work

Table S3. Determination of TBHQ added sesame oil.

Real samples	TBHQ spiked (μM)	TBHQ found (μM)	Recovery (%)	RSD (%)
Sesame oil	50	50.5	101	2.0
	80	79.2	99.0	2.1
	100	99.9	99.9	3.6