

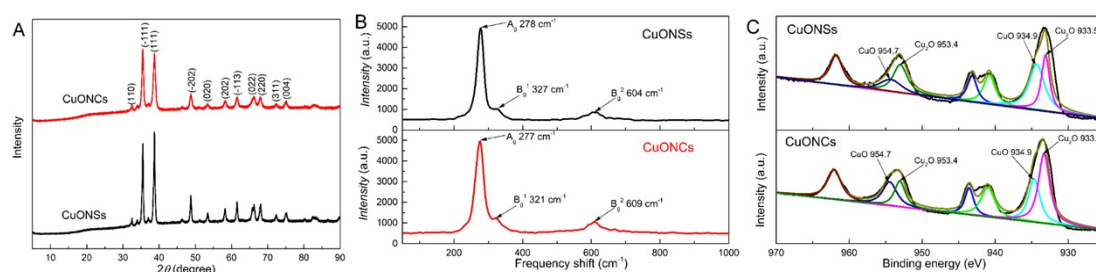
## Electrochemical sensing performance of two CuO nanomaterial-modified dual-working electrodes

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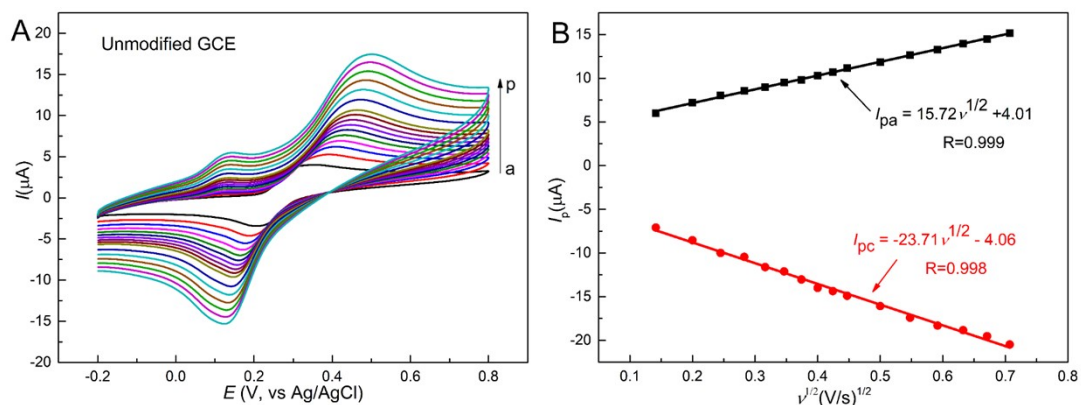
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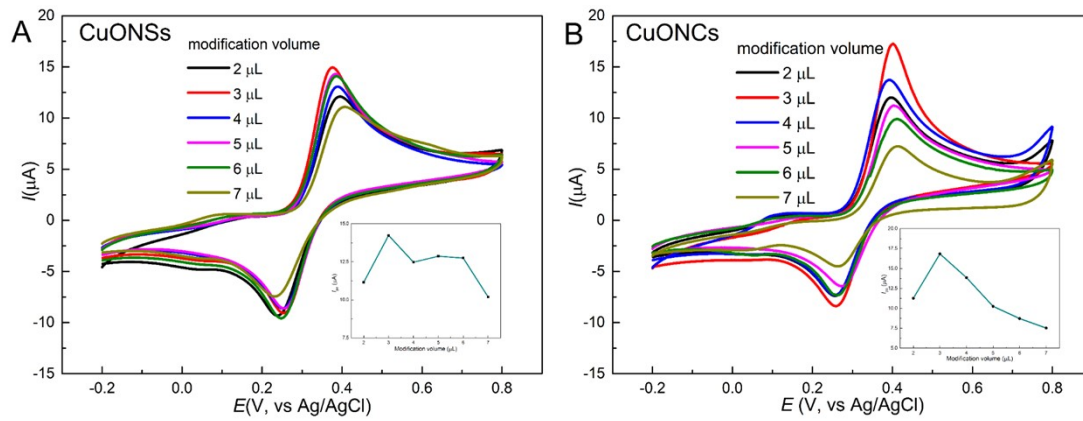
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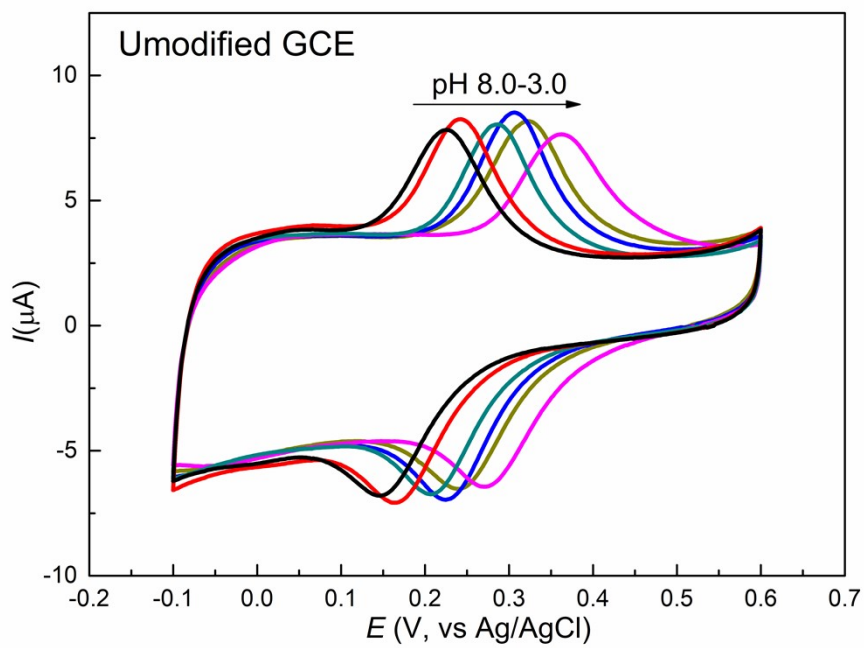
**Fig. S1** XRD patterns (A), Raman spectra (B) and XPS spectra of Cu 2p (C) of CuONSs and CuONCs.



**Fig. S2** (A) CVs of 0.5 mM CT in PBS (pH 7.0) at GCE at different scan rates (a-p: 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 250, 300, 350, 400, 450, 500 mV/s). (B) Linear diagrams of redox peak currents with  $v^{1/2}$ .



**Fig.S3** CVs of 0.5 mM CT in PBS (pH 7.0) at GCE modified by various volumes of CuONSs (A) and CuONCs (B) suspension. Scan rate: 50 mV/s.



**Fig. S4** CV results of 0.5 mM CT in 0.1 M PBS of different pH (From left to right: 8.0, 7.0, 6.0, 5.0, 4.0, 3.0) at unmodified GCE. Scan rate: 50 mV/s.

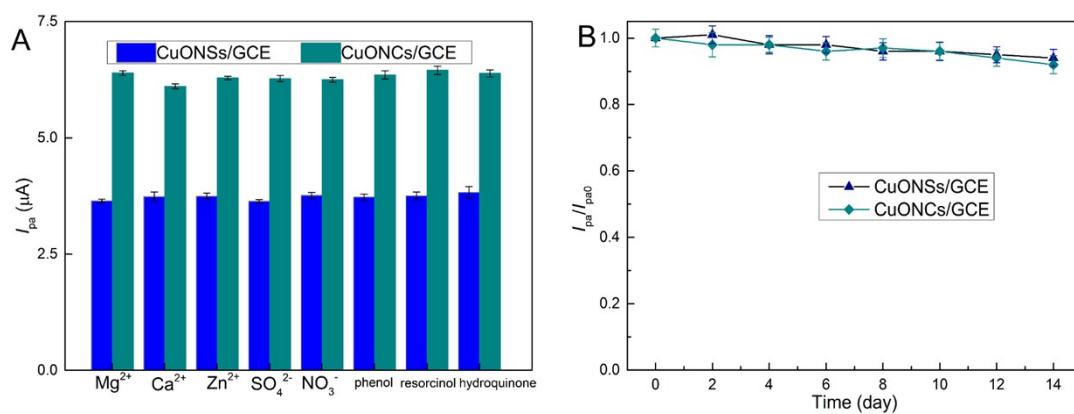
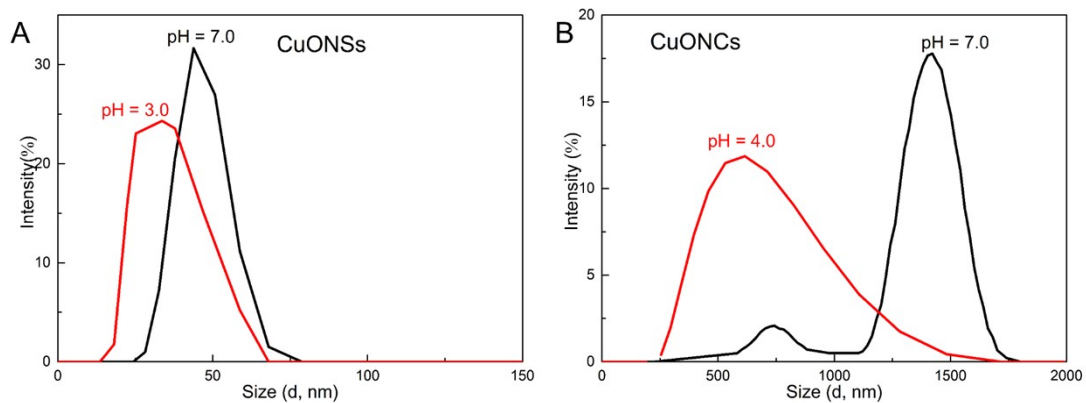


Fig.S5. (A) The LSV oxidation peak currents of 0.1 mM CT solution containing 10-fold of interferences. (B) The ratio of oxidation peak current recorded intermittently (every two days) with the original oxidation peak current of 0.1 mM CT. The supporting electrolyte is 0.1 M PBS (pH 7.0). Three parallel experiments were conducted for each peak current.



**Fig. S6** The size distribution of the CuONSs (A) and CuONCs (B) at different pH.

**Table S1** Oxidation peak potential and current of 0.5 mM CT at unmodified GCE, CuONSs/GCE and CuONCs/GCE

| Electrode        | peak potential<br>(V) | RSD (%)<br>(n=4) | peak current<br>( $\mu$ A) | RSD (%)<br>(n=4) |
|------------------|-----------------------|------------------|----------------------------|------------------|
| unmodified GCE 1 | 0.45                  | 0.1              | 6.42                       | 0.8              |
| unmodified GCE 2 | 0.45                  | 0.1              | 6.41                       | 0.8              |
| CuONSs/GCE       | 0.40                  | 0.2              | 13.8                       | 1.2              |
| CuONCs/GCE       | 0.36                  | 0.2              | 16.9                       | 1.0              |

**Table S2** CT detection results in water samples

|                          | CuONSs/GCE          |                     |                 |                  | CuONCs/GCE          |                     |                 |                  |
|--------------------------|---------------------|---------------------|-----------------|------------------|---------------------|---------------------|-----------------|------------------|
|                          | Added<br>( $\mu$ M) | Found<br>( $\mu$ M) | Recovery<br>(%) | RSD (%)<br>(n=3) | Added<br>( $\mu$ M) | Found<br>( $\mu$ M) | Recovery<br>(%) | RSD (%)<br>(n=3) |
| Tap water                | 80.0                | 78.3                | 97.8            | 1.9              | 80.0                | 78.4                | 98.0            | 1.8              |
|                          | 500                 | 486                 | 97.2            | 2.2              | 500                 | 485                 | 97.0            | 2.3              |
| Yingyuetan<br>lake water | 80.0                | 78.0                | 97.5            | 1.8              | 80.0                | 77.8                | 97.2            | 1.9              |
|                          | 500                 | 483                 | 96.6            | 2.0              | 500                 | 482                 | 96.4            | 2.2              |

**Table S3** Fitted parameters of charge transfer resistance ( $R_{ct}$ ) of different electrodes.

| Electrode  | $R_{ct}$ (k $\Omega$ ) | standard error (%) |
|------------|------------------------|--------------------|
| GCE        | 0.81                   | 2.1                |
| CuONSs/GCE | 1.42                   | 3.0                |
| CuONCs/GCE | 1.26                   | 3.4                |