Supporting information

Zinc ion mediated synthesis of cuprous oxide crystals for non-enzymatic glucose detection

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Table s1. The required reagents for different Cu$_2$O samples

<table>
<thead>
<tr>
<th>Sample name</th>
<th>Ratio of Zn$^{2+}$: Cu$^{2+}$</th>
<th>CuCl$_2$ (0.1 M)/ml</th>
<th>ZnCl$_2$ (0.1 M)/ml</th>
<th>Deionized water/ml</th>
<th>NaOH (0.4 M)/ml</th>
<th>AA (0.1 M)/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Cu$_2$O</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>43</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>P-Cu$_2$O</td>
<td>1: 4</td>
<td>1</td>
<td>0.25</td>
<td>42.75</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>H-Cu$_2$O</td>
<td>1: 2</td>
<td>1</td>
<td>0.5</td>
<td>42.5</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Figure s1. Size distributions of different Cu$_2$O: (a) C-Cu$_2$O, (b) P-Cu$_2$O and (c) H-Cu$_2$O.

Table s2. Morphological and surface area characteristics of the different samples

<table>
<thead>
<tr>
<th>Sample</th>
<th>Morphology</th>
<th>Diameter (nm)</th>
<th>Surface area (m$^2$g$^{-1}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Cu$_2$O</td>
<td>Concave cube-like</td>
<td>304 ± 21</td>
<td>5.487</td>
</tr>
<tr>
<td>P-Cu$_2$O</td>
<td>Porous</td>
<td>326 ± 23</td>
<td>8.397</td>
</tr>
<tr>
<td>H-Cu$_2$O</td>
<td>Hierarchical</td>
<td>309 ± 30</td>
<td>49.577</td>
</tr>
</tbody>
</table>
**Figure s2.** CVs of three different three electrodes with the increase of the concentration of glucose from 0 to 5 mM in 0.1 M NaOH solution at the scan rate of 50 mV.s$^{-1}$. (a) the C-Cu$_2$O/Nafion/GCE electrode, (b) P-Cu$_2$O/Nafion/GCE electrode and H-Cu$_2$O/Nafion/GCE electrode.

**Figure s3.** The amperometric responses of three electrodes at low concentration of glucose: (a) the C-Cu$_2$O/Nafion/GCE electrode, (b) P-Cu$_2$O/Nafion/GCE electrode and (c) H-Cu$_2$O/Nafion/GCE electrode.
Figure s4. Amperometric responses of three electrodes for 0.1 mM glucose in 0.1 mM NaOH at +0.55 V over a long running time of 2000 s: (a) the C-Cu$_2$O/Nafion/GCE electrode, (b) P-Cu$_2$O/Nafion/GCE electrode and (c) H-Cu$_2$O/Nafion/GCE electrode. (d), (e) and (f) corresponding response times of three electrodes.

Figure s5. The reuse stability of three types of Cu$_2$O electrodes towards 0.1 mM glucose in 0.1 M NaOH: (a) the C-Cu$_2$O/Nafion/GCE electrode, (b) P-Cu$_2$O/Nafion/GCE electrode and (c) H-Cu$_2$O/Nafion/GCE electrode