Design and Synthesis of Dodecahedral Carbon Nanocages Incorporated with Fe$_3$O$_4$

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**Figure S1** TEM image of Fe₃O₄ NPs (A), optical photographs of Fe₃O₄/C without (left) and with magnet placing on the side wall of glass vial (right) and M-H curves of Fe₃O₄ NPs and Fe₃O₄/C NCs (C) and (D).
Figure S2 Complex images of Fe$_3$O$_4$/PDA NCs (A) and Fe$_3$O$_4$/C NCs (B), elemental mapping images of C (red, C and D) and Fe (green, E and F).
Table S1. Elemental analysis of Fe$_3$O$_4$/C NCs.

<table>
<thead>
<tr>
<th>Elements</th>
<th>The weight percentage /%</th>
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<tbody>
<tr>
<td>C</td>
<td>36.1</td>
</tr>
<tr>
<td>N</td>
<td>2.8</td>
</tr>
<tr>
<td>H</td>
<td>1.5</td>
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Table S2. ICP results of Fe$_3$O$_4$/C NCs.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Concentration /ppm</th>
<th>The weight percentage /% (Characterization)</th>
<th>The weight percentage /% (Calculation)</th>
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</thead>
<tbody>
<tr>
<td>Zn</td>
<td>30.9</td>
<td>30.0</td>
<td>37.4 (ZnO)</td>
</tr>
<tr>
<td>Fe</td>
<td>5.0</td>
<td>4.9</td>
<td>20.3 (Fe$_3$O$_4$)</td>
</tr>
</tbody>
</table>
Figure S3 TEM images of Fe₃O₄/ZIF-8 nanostructure with different quantity of Fe₃O₄ NPs with 1mg (A), 2mg (C), and 5 mg (E) and the corresponding Fe₃O₄/C NCs (B, D and F). The insets are the TEM images of corresponding Fe₃O₄/ZIF-8 nanostructure and Fe₃O₄/C NCs with high magnification.
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