Supporting Information

Self-assembled Graphene Coupled Hollow-Structured γ-Fe$_2$O$_3$ Spheres with Crystal of Transition for Enhanced Supercapacitors

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Table S1. Physical and electrochemical properties reported in recent papers for FeOx-based electrodes in a negative potential range in various aqueous electrolytes.1-10

<table>
<thead>
<tr>
<th>Material</th>
<th>Electrolyte</th>
<th>Measurement system</th>
<th>Specific Capacitance (F g⁻¹)</th>
<th>Method</th>
<th>Cycle life (year)</th>
<th>Ref. (year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porous α-Fe₂O₃ film</td>
<td>1 M Li₂SO₄</td>
<td>Three-electrode</td>
<td>146</td>
<td>CV 5 mV s⁻¹</td>
<td>500 (~60%)</td>
<td>2009</td>
</tr>
<tr>
<td>α-Fe₂O₃ NTs/ RGO</td>
<td>1 M Na₂SO₄</td>
<td>Three-electrode</td>
<td>215</td>
<td>CV 2.5 mV⁻¹</td>
<td>2000 (stability)</td>
<td>2012</td>
</tr>
<tr>
<td>Mesoporous α-Fe₂O₃</td>
<td>1 M Li₂SO₄</td>
<td>Three-electrode</td>
<td>116</td>
<td>CD 0.75 A g⁻¹</td>
<td>1000 (74%)</td>
<td>2011</td>
</tr>
<tr>
<td>Nanosized α-LiFeO₂</td>
<td>0.5 M Li₂SO₄</td>
<td>Three-electrode</td>
<td>40</td>
<td>CV 5 mV⁻¹</td>
<td>500 (100%)</td>
<td>2010</td>
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<tr>
<td>FeOx-carbon nanofoams</td>
<td>2.5 M Li₂SO₄</td>
<td>Three-electrode</td>
<td>84</td>
<td>CV 5 mV⁻¹</td>
<td>1000 (~81%)</td>
<td>2010</td>
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<tr>
<td>Fe₃O₄ nanocrystal</td>
<td>1 M Na₂SO₄</td>
<td>Three-electrode</td>
<td>5.3</td>
<td>CD 15 mA g⁻¹</td>
<td>Not reported</td>
<td>2003</td>
</tr>
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<td>Fe₃O₄ particles graphene</td>
<td>1 M KOH</td>
<td>Three-electrode</td>
<td>220.1</td>
<td>CD 0.5 A g⁻¹</td>
<td>1000 (~78%)</td>
<td>2014</td>
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<tr>
<td>Fe₃O₄/carbon nanosheets</td>
<td>1 M Na₂SO₃</td>
<td>Three-electrode</td>
<td>163.4</td>
<td>CD 1 A g⁻¹</td>
<td>1000 (~85%)</td>
<td>2013</td>
</tr>
<tr>
<td>Fe₃O₄ nanoparticles</td>
<td>1 M Na₂SO₃</td>
<td>Three-electrode</td>
<td>207.7</td>
<td>CD 0.4 A g⁻¹</td>
<td>Not reported</td>
<td>2013</td>
</tr>
</tbody>
</table>
**Fig S1.** Fourier transform infrared spectra of Self-assembled Graphene Coupled Hollow-Structured γ-Fe2O3 Spheres (SHFS-300, SHFS-400, SHFS-500) and GO.

**Fig S2.** TGA curve of SHFS-500 under air at a rate of 10°C min⁻¹ from 50 to 800 °C. The mass ratio of γ-Fe₂O₃ is 68.7% in SHFS-500.
Fig S3. CV curves of SHFS at different scan rates.

Fig S4. CD curves of SHFS at different current densities.

Fig S5. Cycle life of SHFS, SHF-300 and SHF-400 pure Fe$_2$O$_3$ at 10 A g$^{-1}$ in 1 M Na$_2$SO$_4$ solution.
Fig S6. (a,b) CV curves of SHF-300 and SHFS-400 at different scan rates.

Fig S7. (a,b) CD curves of SHF-300 and SHFS-400 at different current densities.

Fig S8. (a,b) Cycle life of SHF-300 and SHF-400 at 10 A g⁻¹ in 1 M Na₂SO₄ solution.
Fig S9. EIS spectra of the electrode material SHFS and SHFS-500.

Fig S10. Cycle life of SHFS-500 at 10A g⁻¹ in 1 M Na₂SO₄ solution.
Fig S11. (a–b) Typical SEM image of pure Fe$_2$O$_3$ nanoparticles.

Fig S12. Nitrogen adsorption and desorption isotherms and the corresponding pore size distribution curve of pure Fe$_2$O$_3$.

Fig S13. (a) CV curves of pure Fe$_2$O$_3$ at different scan rates. (b) Cycle life of pure Fe$_2$O$_3$ at 10A g$^{-1}$ in 1 M Na$_2$SO$_4$ solution.
References