Electronic Supporting Information

Reprocessable Squeezing Electrode Fabrication of Olive-Like Fe/Co/O Nanoparticles@Three Dimensional Nitrogen-doped Reduced Graphene Oxide for High Performance Lithium Battery

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Figure S1 (a) SEM image of the obtained 3D macroporous structure. (b) (c) HRTEM images of olive-like nanoparticles exited between graphene layers. (d) HRTEM image of folded edges of graphene.
Figure S2 HRTEM images of olive-like nanoparticles embedded between continuous conductive networks.
Figure S3 (a) SEM image of physical mixture Fe/Co/O+3D N-rGO. (b) SEM image of individual growth of Fe₃O₃ or in 3D N-doped reduced graphene oxide structure. (c) Co₄O₄@3D N-rGO.
Figure S4 (a) SEM image of Fe/Co/O @ 3D N-rGO composite. (b-e) the corresponding EDX mapping images of C (b), N (c), Fe (d) and Co (e) elements.
Figure S5 (a) TGA curves (b) Raman spectra of Fe/Co/O@3D N-rGO and GO.
Figure S6 (a) CVs for the first three cycles at a potential scanning rate of 0.1 mV s$^{-1}$. (b) Typical charge-discharge voltage curves of the Fe/Co/O @3D N-rGO electrode at a current density of 1000 mA g$^{-1}$.
**Figure S7** Rate capacity of rGO at different current densities.
Figure S8 (a) Nyquist plots of the obtained Fe/Co/O@3D N-rGO, Fe$_2$O$_3$@3D N-rGO and Fe/Co/O+3D N-rGO. (b) Randles equivalent circuit for the three samples.

Table S1 Impedance parameters derived using the equivalent circuit model for Fe/Co/O@3D N-rGO, Fe$_2$O$_3$@3D N-rGO and Fe/Co/O+3D N-rGO

<table>
<thead>
<tr>
<th>Samples</th>
<th>$R_{SEI}$ (Ω)</th>
<th>$R_{ct}$ (Ω)</th>
</tr>
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<tbody>
<tr>
<td>Fe/Co/O@3D N-rGO</td>
<td>27.9</td>
<td>30.7</td>
</tr>
<tr>
<td>Fe$_2$O$_3$@3D N-rGO</td>
<td>78.4</td>
<td>159.2</td>
</tr>
<tr>
<td>Fe/Co/O+3D N-rGO</td>
<td>149.8</td>
<td>581.9</td>
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</table>
Figure S9 SEM images of the free-standing Fe/Co/O@3D N-rGO electrode after 500 cycles at the current density of 1000 mA g$^{-1}$. 