Supporting information for

Vertically Aligned Binder-Free TiO$_2$ Nanotube Arrays Doped with Fe, S and Fe-S for Li-ion Batteries

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Fig. S1(a) XRD results of amorphous and crystalline TNTs. The diffraction peak notations Ti respond to titanium. (b) XPS spectra for O 1s of Fe-S doped TNTs.
Fig. S2 (a), (b), (c) and (d) Cyclic voltammetry curves at a scan rate 0.5mVs$^{-1}$ for Fe-S, Fe, S doped TNTs and bare TNTs (thickness of 12μm), respectively.
Fig. S3 Gravimetric and areal capacity retention with cycling of bare and Fe-S doped TNT anodes discharged at current density of 0.3mAcm$^{-2}$. 
Fig. S4 (a) EIS spectrum of before and after cycling for Fe-S doped TNTs. (b) Diffusion coefficient values as calculated using Randles–Sevcik equation for doped and elongated TNTs, respectively.
Table S1†. Calculated lattice parameters and crystallite sizes of TNTs.

<table>
<thead>
<tr>
<th>Material</th>
<th>Lattice constant (d_{011})&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Avg. crystallite size&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare</td>
<td>0.350 nm</td>
<td>45.930 nm</td>
</tr>
<tr>
<td>Fe doped</td>
<td>0.454 nm</td>
<td>39.636 nm</td>
</tr>
<tr>
<td>S doped</td>
<td>0.452 nm</td>
<td>30.319 nm</td>
</tr>
<tr>
<td>Fe-S doped</td>
<td>0.455 nm</td>
<td>32.380 nm</td>
</tr>
</tbody>
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<sup>a</sup> calculated via Bragg’s equation. <sup>b</sup> calculated via Scherrer equation