Electronic Supplementary Information for

Boosting supercapacitive performance of ultrathin mesoporous NiCo$_2$O$_4$ nanosheet arrays by surface sulfation

Figure S1 XRD spectrum for the as-deposited sample on Ni foam

The as-deposited sample is denoted as p-NiCo$_2$O$_4$, p-S0.25M and P-S0.5M, respectively. The four main peaks at 22.4°, 34.0°, 38.5°, 59.2° correspond to a rhombohedral structure of Co–Ni layered double hydroxides.¹

The average crystalline sizes of all samples are calculated by Scherrer Equation² and combined with XRD data (1) as following:

$$D_{hkl} = \frac{K\lambda}{B_{hkl}\cos\theta}$$

$D_{hkl}$ is the crystallite size in nanometers, hkl are the Miller indices of the lattice planes being analyzed. $\lambda$ is the wavelength of X-ray, taken as 0.154056 nm. $B_{hkl}$ is the peak width of the X-ray diffraction peak profile at half-maximum height in radians and $K$ is the numerical crystallite-shape factor, normally taken as 0.9 and $\theta$ is the Bragg angle. Full Width Half Maximum (abbreviated as FWHM) is the $B_{hkl}$ in degrees. In order to acquire relatively accurate crystallite size, the (311) plane with most prominent diffraction peak is choosed for calculation.

Table S1. The crystalline sizes of the samples

<table>
<thead>
<tr>
<th>Sample Name</th>
<th>2θ (degree)</th>
<th>FWHM (degree)</th>
<th>$D_{311}$ (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pristine NiCo$_2$O$_4$</td>
<td>36.894</td>
<td>0.655</td>
<td>12.02</td>
</tr>
<tr>
<td>S0.25M</td>
<td>36.668</td>
<td>0.723</td>
<td>11.45</td>
</tr>
<tr>
<td>S0.5M</td>
<td>36.688</td>
<td>0.719</td>
<td>11.51</td>
</tr>
</tbody>
</table>

¹ This journal is © The Royal Society of Chemistry 2018
Figure S2 High-magnified SEM images of (a) NiCo$_2$O$_4$, (b) S0.25M and (c) S0.5M after 5000 cycling tests.

Figure S3 TEM images and the inset SAED pattern of (a) NiCo$_2$O$_4$, (b) S0.25M and (c) S0.5M after 5000 cycling tests.

Figure S4 The core-level S 2p spectra of (a) S0.25M and (b) S0.5M at different stages including before cycling tests, after fully activated.

References