Supporting Information

Solution-processed Poly (3,4-ethylenedioxythiophene) Nanocomposite Paper Electrodes for Flexible High-Capacitance Supercapacitors

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Figure S1. SEM images of bulk cellulose paper (a) and nanocellulose paper (b).

Figure S2. Low magnification SEM images of PEDOT bulk paper (a) and PEDOT nanopaper (b).
Figure S3. Nitrogen adsorption/desorption isotherms for the two PEDOT-based papers.
Figure S4. The PEDOT bulk paper showed a limited flexibility with induced cracks in the electrode after slight bending.
Figure S5. CV profiles for the PEDOT nanopaper electrode in a three-electrode setup in 1 M H$_2$SO$_4$.

Figure S6. CV profiles for the PEDOT nanopaper-based supercapacitors.
Figure S7. The gravimetric and volumetric electrode specific capacitance for the PEDOT nanopaper electrode at different current densities.
**Figure S8.** The specific electrode gravimetric energy and power densities for the PEDOT-based paper electrode after normalization with respect to the electrode weight.

![Graph showing specific electrode gravimetric energy and power densities](image)

**Figure S9.** CV profiles of PEDOT nanopaper-based supercapacitor with respect to time.

![Graph showing CV profiles](image)

**Figure S10.** Cyclic voltammograms (a) and charge and discharge curves (b) for the two-cell tandem supercapacitor.

![Graphs showing cyclic voltammograms and charge-discharge curves](image)
Table S1. Comparison of cycling performances of PEDOT-based supercapacitors.

<table>
<thead>
<tr>
<th>Materials</th>
<th>Cycling capability</th>
<th>Remarks</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEDOT-NWs/CC</td>
<td>70%, 1000 cycles (4.1 A/g)</td>
<td>a</td>
<td>1</td>
</tr>
<tr>
<td>PEDOT paper</td>
<td>91%, 2000 cycles (2 mA/cm²)</td>
<td>b</td>
<td>2</td>
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<tr>
<td>PEDOT</td>
<td>55%, 20000 cycles (25 mV/s)</td>
<td>a</td>
<td>3</td>
</tr>
<tr>
<td>PEDOT@carbon paper</td>
<td>~ 60%, 10000 cycles (1 mA/cm²)</td>
<td>b</td>
<td>4</td>
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<tr>
<td>PEDOT nanofibers</td>
<td>90%, 10000 cycles (2 mA/cm²)</td>
<td>b</td>
<td>5</td>
</tr>
<tr>
<td>PEDOT/carbon fiber</td>
<td>90%, 12000 cycles (5 A/g)</td>
<td>b</td>
<td>6</td>
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<tr>
<td>PEDOT/PEDOT:PSS/paper</td>
<td>80%, 10000 cycles (0.2 mA/cm²)</td>
<td>b</td>
<td>7</td>
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<td>PEDOT/CNTs</td>
<td>94%, 3000 cycles (0.1 A/g)</td>
<td>b</td>
<td>8</td>
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<td>EVPP-PEDOT</td>
<td>92%, 10000 cycles (1.8 mA/cm²)</td>
<td>b</td>
<td>9</td>
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<td>MWCNTs@PEDOT/PSS</td>
<td>97.8%, 5000 (100 mV/s)</td>
<td>b</td>
<td>10</td>
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<tr>
<td>PEDOT/MWCNTs/rGO</td>
<td>88%, 4000 (100 mV/s)</td>
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<td>11</td>
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<tr>
<td>PEDOT nanopaper</td>
<td>93.2%, 15000 cycles (30 mA/cm²)</td>
<td>b</td>
<td></td>
</tr>
</tbody>
</table>

a 3-electrode set-up; b 2-electrode set-up;

