Supporting Information

Natively stretchable micro-supercapacitors based on PEDOT:PSS hydrogel

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**Fig. S1.** Images of (a) the PEDOT:PSS solutions heated at 90 °C for 3h and (b) the PEDOT:PSS-LiTFSI hydrogels heated after 90 °C for 3h.

**Fig. S2.** The customized MSCs with different fingers and sizes and their corresponding CV curves.

**Fig. S3.** The customized patterns of “City U” with different sizes.
<table>
<thead>
<tr>
<th>Material</th>
<th>Method</th>
<th>Structure</th>
<th>Electrolyte</th>
<th>Capacitance</th>
<th>Energy density</th>
<th>Power density</th>
<th>Cycling</th>
<th>Stretchability</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWCNT/PANI</td>
<td>3D printing/sputter/injection</td>
<td>Concave wavy</td>
<td>PMMA/LiClO₄</td>
<td>44.13 mF cm⁻²</td>
<td>0.004 mWh cm⁻²</td>
<td>0.07 mW cm⁻²</td>
<td>87% remained after 20000 cycles</td>
<td>88% remained at 40% strain</td>
<td>[1]</td>
</tr>
<tr>
<td>Graphene/NiO/Co₃O₄</td>
<td>Laser/coating</td>
<td>3D porous</td>
<td>PVA/H₃PO₄</td>
<td>2.4 mF cm⁻²</td>
<td>Not shown</td>
<td>Not shown</td>
<td>98.4% after 10000 cycles</td>
<td>77.1% at 50% strain</td>
<td>[2]</td>
</tr>
<tr>
<td>MnO₂/CNTs</td>
<td>photolithography</td>
<td>fractal pattern</td>
<td>[BMIM][TFSI]/PMA</td>
<td>12.6 mF cm⁻²</td>
<td>1.12 μWh cm⁻²</td>
<td>3.99 μW cm⁻²</td>
<td>75% after 10000 cycles</td>
<td>96% at 30% strain</td>
<td>[3]</td>
</tr>
<tr>
<td>Graphene/PEDOT: PSS</td>
<td>Laser/coating</td>
<td>3D porous</td>
<td>PAAK/KOH</td>
<td>720 μF cm⁻² at 75 μA cm⁻²</td>
<td>Not shown</td>
<td>Not shown</td>
<td>96% remained after 10000 cycles</td>
<td>38.9% remained at 200% strain</td>
<td>[4]</td>
</tr>
<tr>
<td>SWCNT</td>
<td>CVD/laser/pre-stretch</td>
<td>buckled structure</td>
<td>PVA/H₃PO₄</td>
<td>15.1 μF cm⁻²</td>
<td>Not shown</td>
<td>Not shown</td>
<td>1000 cycles</td>
<td>Max: 200%</td>
<td>[5]</td>
</tr>
<tr>
<td>Reduced graphene oxide</td>
<td>Photolithography</td>
<td>Suspended wavy belts</td>
<td>PVA/H₃PO₄</td>
<td>0.54 mF cm⁻² at 500 mV s⁻¹</td>
<td>0.52 mWh cm⁻²</td>
<td>417 mW cm⁻²</td>
<td>5000 cycles</td>
<td>Max: 100% Remainin</td>
<td>[6]</td>
</tr>
<tr>
<td>PEDOT hydrogel</td>
<td>Laser/injection</td>
<td>Flat gel film</td>
<td>PVA/H₂SO₄</td>
<td>41.38-47.59 mF cm⁻²</td>
<td>0.0036-0.0042 mWh cm⁻²</td>
<td>0.04-0.4 mW cm⁻²</td>
<td>&gt;98% after 10000 cycles</td>
<td>93% remained at 200% strain</td>
<td>This work</td>
</tr>
</tbody>
</table>


