Electronic Supplementary Information

Polydopamine Functionalized Transparent Conductive Cellulose Nanopaper
with Long-Term Durability

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Fig. S1. Digital photographs of the PDA@NFC solutions treated with 0, 0.5, 1.0, 1.5, and 2.0 g/L of DPA dispersions.

<table>
<thead>
<tr>
<th>°C</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>110</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T%$ (550nm)</td>
<td>89.29</td>
<td>93.74</td>
<td>90.93</td>
<td>88.20</td>
<td>84.77</td>
</tr>
<tr>
<td>$R_s$ (ohm/sq)</td>
<td>13.1</td>
<td>13.7</td>
<td>14.2</td>
<td>14.4</td>
<td>14.8</td>
</tr>
</tbody>
</table>

Fig. S2. Transparent conductive performance of PDA@NFC-AgNWs TCCNP at different drying temperature.
Fig. S3. TEM images of (a) NFC, (b) PDA and (c,d) PDA@NFC.

Fig. S4. SEM images of (a) NFC CNP and (b) PDA@NFC CNP.
Fig. S5. AFM images of (a, b) NFC-AgNWs TCCNP and (c, d) PDA@NFC-AgNWs TCCNP.

Fig. S6. Contact angles of (a) pristine NFC, (b) PDA@NFC, (c) NFC-AgNWs, and (d) PDA@NFC-AgNWs nanopapers.
Fig. S7. Energy dispersive X-ray spectroscopy (EDS) spectra of the NFC-AgNWs TCCNP (a) before and (b) after exposure in air for 150 days.

Fig. S8. Digital photographs of PDA@NFC -AgNWs TCCNP immersed in (a) pH=3, HNO$_3$ solution, (b) 4 wt% NaOH solution, (c) 4 wt% NaCl solution and (d) 4 wt% Na$_2$S solution for 180 minutes, respectively.
a) 
Sheet resistance (Ohm/sq) vs Time (min)

b) 
Sheet resistance (Ohm/sq) vs Time (min)
Fig. S9. Sheet resistance as a function of immersing time for NFC-AgNWs TCCNP and PDA@NFC-AgNWs TCCNP in (a) pH=3, HNO$_3$ solution, (b) 4 wt% NaOH solution, (c) 4 wt% NaCl solution and (d) 4 wt% Na$_2$S solution, respectively.