Supporting Information

Electrospinning-derived ultrafine silver-carbon composite nanofibers for flexible transparent conductive films

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Fig. S1 (a) SEM image and optical photo of silver nanowire with average diameter of about 50 nm and average length of 20 µm; (b) optical photo of dispersive solutions containing Ag/CNFs with different diameter from 30 nm to 500 nm.

Fig. S2 Schematic diagram of TCF fabrication: (a) suction filtration through membrane; (b) PET transfer; (c) treatment in acetone vapor.
Fig. S3 SEM images of Ag/CNFs composite samples fabricated using different conditions: (a) without glucose; (b) with pre-oxidation treatment; (c) with high flow rate of NH$_3$; (d) with weight ratio of 1:1 between AgNO$_3$ and PAN.

Fig. S4 SEM images of Ag/CNFs with different diameter: (a) 30 nm; (b) 200 nm; (c) 500 nm.

Rs=135.9 Ω/sq, T=75.8%Rs=349.2 Ω/sq, T=74.8%Rs=679.6 Ω/sq, T=75.2%

Fig. S5 SEM images of TCFs produced by different deposition orders: (a) deposition
of first AgNWs and then Ag/CNFs; (b) deposition of first Ag/CNFs and then AgNWs; (c) deposition of AgNW and Ag/CNFs mixture. The dash line represents AgNWs buried under Ag/CNFs, and the arrows indicate deformed AgNWs induced by flexibility of AgNWs and large diameter of Ag/CNFs.

![Fig. S6 SEM images](image)

Fig. S6 SEM images: (a) the melting junctions between Ag/CNFs-Ag/CNFs (arrow 1); (b) the interfused cross section between AgNWs-AgNWs (arrow 2) and AgNWs-Ag/CNFs (arrow 3); (c) welding of adjacent AgNWs after high temperature treatment; (d) the crossion in HCl solution with high concentration.

Table S1 Relationship between surface concentration of AgNWs and performance (sheet resistance and transmittance) of TCFs.

<table>
<thead>
<tr>
<th>Surface concentration of AgNWs (mg/m²)</th>
<th>28</th>
<th>33</th>
<th>38</th>
<th>43</th>
<th>48</th>
<th>53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet resistance (Ω/sq)</td>
<td>13600.0</td>
<td>1200.0</td>
<td>581.8</td>
<td>232.3</td>
<td>132.7</td>
<td>95.5</td>
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<tr>
<td>Transmittance at 550 nm (%)</td>
<td>92.5</td>
<td>92.0</td>
<td>91.1</td>
<td>89.2</td>
<td>87.6</td>
<td>85.3</td>
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