Supplementary Information

Capacitive performance of porous carbon nanosheets derived from biomass cornstalk

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Table S1 Structure properties of aCS electrodes their capacitive performances in 6.0 M KOH electrolyte.

<table>
<thead>
<tr>
<th>Electrodes</th>
<th>$S_{\text{BET}}$ (m$^2$ g$^{-1}$)</th>
<th>$V_t$ (cm$^3$ g$^{-1}$)$^a$</th>
<th>$V_{\text{mic}}$ (cm$^3$ g$^{-1}$)$^b$</th>
<th>$I_D/I_G$</th>
<th>Specific capacitance (F g$^{-1}$)$^c$</th>
<th>Capacitance retention (%) (1–60 A g$^{-1}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aCS</td>
<td>388</td>
<td>0.23</td>
<td>0.15</td>
<td>0.94</td>
<td>164</td>
<td>64</td>
</tr>
<tr>
<td>aCS-4</td>
<td>1533</td>
<td>0.82</td>
<td>0.59</td>
<td>1.01</td>
<td>279</td>
<td>78</td>
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<tr>
<td>aCS-5</td>
<td>1736</td>
<td>0.92</td>
<td>0.59</td>
<td>0.99</td>
<td>301</td>
<td>82</td>
</tr>
<tr>
<td>aCS-6</td>
<td>1331</td>
<td>0.72</td>
<td>0.51</td>
<td>0.99</td>
<td>248</td>
<td>85</td>
</tr>
</tbody>
</table>

$^a$ Total pore volume measured at relative pressure of 0.99.

$^b$ Micropore volume (pore size <2 nm) analyzed from NLDFT.

$^c$ Specific capacitance measured at current density of 1.0 A g$^{-1}$ in three-electrode cell with 6.0 M KOH as an aqueous electrolyte.
**Fig. S1** (a) Survey XPS spectra and (b) high-resolution XPS spectra of C1 s of aCS and aCS-5.
Fig. S2 (a) CV, (b) galvanostatic charge-discharge at 2.0 A g\(^{-1}\), and (c) capacitance retention of aCs and aCs-\(x\) electrodes at different current densities. Data obtained from three-electrode cell.
Fig. S3 CV profiles of aCS-5-based capacitor over a wide range of scan rates in 6.0 M KOH (a, b) and 1.0 M Na$_2$SO$_4$ aqueous electrolyte (c). Data obtained from two-electrode cell.
Fig. S4 Bode plots of phase angle verses frequency of aCS-5 capacitor in 6.0 M KOH and 1.0 M Na$_2$SO$_4$ aqueous electrolyte.
Fig. S5 Voltage drop (IR drop) of the galvanostatic charge-discharge curves of the 1st and 10000th cycles for aCS-5-based capacitor in 6.0 M KOH (a) and 1.0 M Na$_2$SO$_4$ electrolyte (b).