Supplementary information

Three-dimensional porous graphene-like synthesized from biocarbon via low-temperature graphitization for supercapacitor

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Fig. 1S. Synthetic procedure of the biocarbon used herein.
Fig. 2S. Raman mapping of the biocarbon used herein.

Fig. 3S. XRD patterns of the 3DPGLS and biocarbon samples.

Fig. 4S. XPS spectra of the 3DPGLS sample.
<table>
<thead>
<tr>
<th>Sample</th>
<th>Yield %</th>
<th>Tapping density g/cm³</th>
<th>$S_{BET}$ m²/g</th>
<th>Conductivity S/cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3DPGLS</td>
<td>32.93%</td>
<td>0.24</td>
<td>1506.19</td>
<td>32.14</td>
</tr>
</tbody>
</table>

**Table S1.** Characteristics of the 3DPGLS sample.

![Graph](image)

**Fig. 5S.** TG and DTG curves of the biomass sample used herein.

![Images](image)

**Fig. 6S.** SEM images biomass tracheid (a) and its section (b), and biocarbon (c) and its section (d).
Fig. 7S. SEM images of 3DPGLS samples obtained from different biocarbons: walnut shell (a), pistachio shell (b), apricot shell (c), and hazelnut shell (d).

Fig. 8S. SEM image of 3DPGLS using Na$_2$CO$_3$ as a catalyst.