B, N-dual Doped Sisal-based Multiscale Porous Carbon for High-rate Supercapacitors†

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Fig. S1. (a-c) SEM images of the sisal fiber carbonized at 800 °C.

Fig. S2. SEM image of the BN-SC.
Fig. S3. TEM images of the BN-SAC-3, BN-SAC-2 and BN-SAC-1.

Table S1 Density of BN-SAC-n series.

| Samples | BN-SAC-3 | BN-SAC-2 | BN-SAC-1 |
|---------|----------|----------|----------|
| Density (g cm\(^{-3}\)) | 0.43 | 0.49 | 0.53 |

Table S2 Relative surface content (%) of nitrogen, boron, oxygen and carbon obtained by XPS survey spectra.

| Samples | N at. (%) | B at. (%) | O at. (%) | C at. (%) |
|---------|-----------|-----------|-----------|-----------|
| BN-SAC-1 | 2.6       | 0.8       | 6.5       | 90.1      |
| BN-SAC-2 | 4.0       | 2.4       | 6.7       | 86.9      |
| BN-SAC-3 | 4.5       | 3.8       | 7.8       | 83.9      |
Fig. S4. Galvanostatic charge-discharge curves of the BN-SAC-3 at current densities of 10-40 A g$^{-1}$

Fig. S5. Assembled SSCs in various voltage windows at a scan rate of 200 mV s$^{-1}$
Fig. S6. Galvanostatic charge-discharge curves of SCCs using (a) 6 M KOH and (b) 1 M TEABF$_4$/AN electrolytes at current densities of 5 and 10 A g$^{-1}$.

Fig. S7. Cycling performance of SCCs using different electrolytes at current density of 10 A g$^{-1}$. 
Table S3. Electrochemical properties reported in literature for biomass-derived and heteroatomic doping carbon-based EDLC electrodes.

| Samples                                      | $S_{\text{BET}}$ ($\text{m}^2\text{g}^{-1}$) | Electrolyte (testing method) | SC (F g$^{-1}$) | Rate Capability | Ref. |
|----------------------------------------------|---------------------------------------------|------------------------------|-----------------|-----------------|------|
| Honeycomb-shaped carbon network              | 1313                                        | 6M KOH (3-electrode)         | 275 (20 A g$^{-1}$) | 58 % (0.5 A g$^{-1}$ - 20 A g$^{-1}$) | [S1] |
| Graphene/N-doped carbon composite            | 1569                                        | 1 M H$_2$SO$_4$ (3-electrode) | 259 (20 A g$^{-1}$) | 69 % (0.2 A g$^{-1}$ - 20 A g$^{-1}$) | [S2] |
| Bagasse-derived carbon                       | 2296                                        | 6M KOH (3-electrode)         | 227 (50 A g$^{-1}$) | 71 % (0.5 A g$^{-1}$ - 50 A g$^{-1}$) | [S3] |
| Boron and nitrogen-doped porous graphitic    | 1567                                        | 6M KOH (3-electrode)         | 200 (40 A g$^{-1}$) | 64 % (1 A g$^{-1}$ - 40 A g$^{-1}$) | [S4] |
| carbon                                        |                                             |                              |                 |                 |      |
| PAN-based activated carbon fibers             | 843                                         | 6M KOH (3-electrode)         | 208 (0.05 A g$^{-1}$) | 62 % (1 A g$^{-1}$ - 10 A g$^{-1}$) | [S5] |
| B,N co-doped porous carbon                   | 710                                         | 1 M H$_2$SO$_4$ (3-electrode) | 176 (3 A g$^{-1}$) | 76 % (1 A g$^{-1}$ - 3 A g$^{-1}$) | [S6] |
| N-doped hierarchical porous carbon framework | 1056                                        | 1 M H$_2$SO$_4$ (3-electrode) | 190 (20 A g$^{-1}$) | 76 % (2 A g$^{-1}$ - 20 A g$^{-1}$) | [S7] |
| Cornstalk derived carbon nanosheets          | 540                                         | 6M KOH (3-electrode)         | 213 (1 A g$^{-1}$) | 75 % (1 A g$^{-1}$ - 20 A g$^{-1}$) | [S8] |
| Polyaniline derived carbon nanosheets        | 1957                                        | 1 M H$_2$SO$_4$ (3-electrode) | 315 (1 A g$^{-1}$) | 46 % (1 A g$^{-1}$ - 30 A g$^{-1}$) | [S9] |
| Nitrogen enriched PAN-based activated carbon fibers | 705                                      | 6M KOH (3-electrode)         | 210 (1 A g$^{-1}$) | 71 % (1 A g$^{-1}$ - 30 A g$^{-1}$) | [S10] |
References

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