

Supporting Information

Architecture design of nitrogen-doped 3D bubble-like porous graphene for high performance sodium ion batteries

Yun Qiao,^{a, b} Xiaoguang Cheng,^{a, b} Yang Liu,*^a Ruimin Han,^{a, b} Mengyue Ma,^{a, b}
Qingling Li,^{a, b} Hongyu Dong,^{a, b} Xiangnan Li,^{a, b} and Shuting Yang*^{a, b}

^a School of Chemistry and Chemical Engineering, Henan Normal University,
Xinxiang 453007, China

^b National and Local Joint Engineering Laboratory of Motive Power and Key
Materials, Xinxiang 453007, China

Corresponding Author

*E-mail: liuy986@163.com, liuy986@htu.edu.cn; (Yang Liu)

*E-mail: shutingyang@foxmail.com. (Shuting Yang)

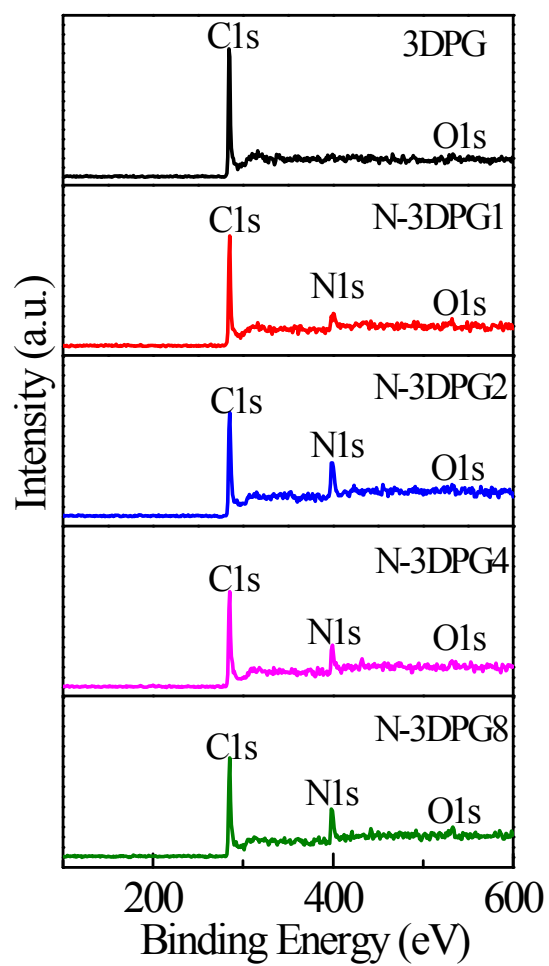


Fig. S1 X-ray photoelectron survey spectra of the samples.

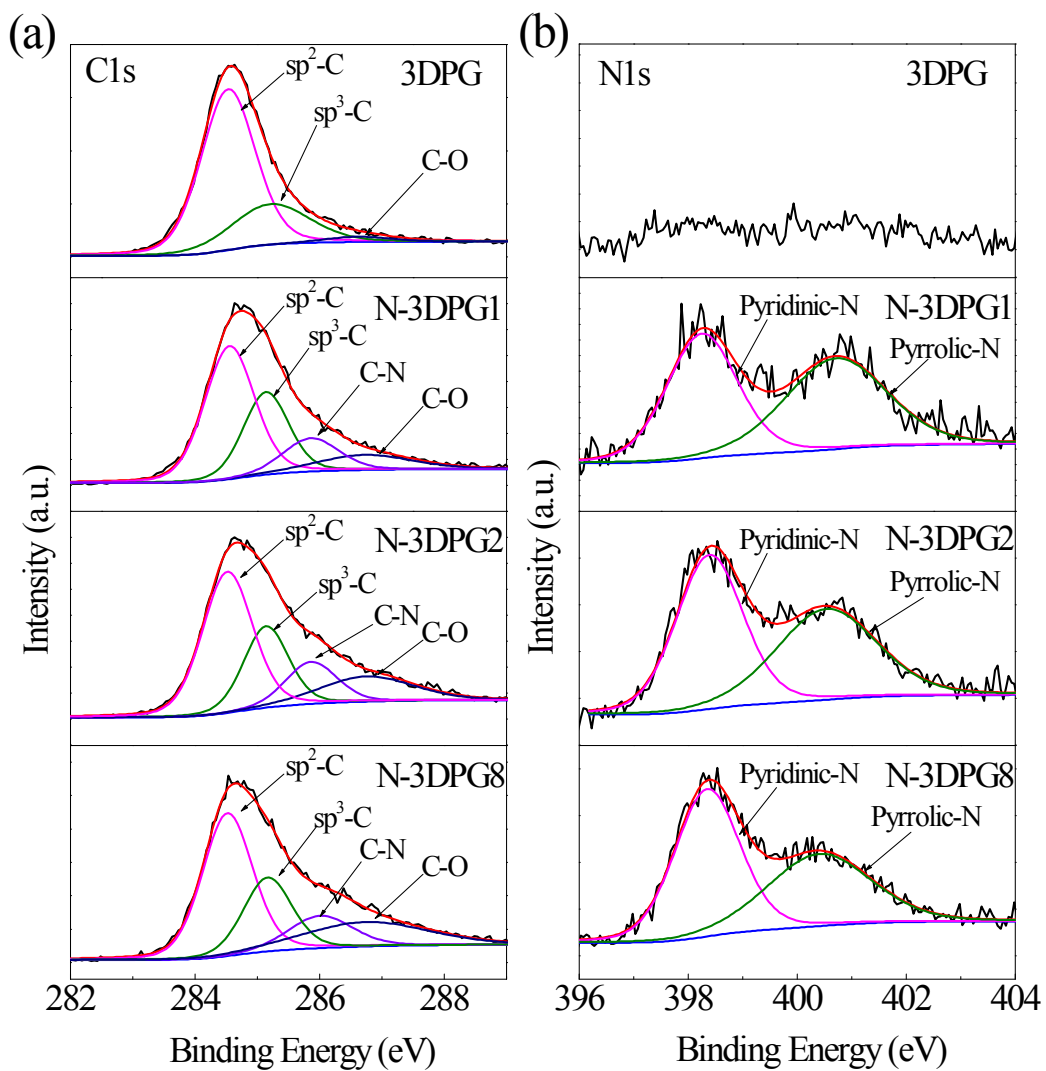


Fig. S2 High-resolution (a) C1s spectra and (b) N1s of the samples.

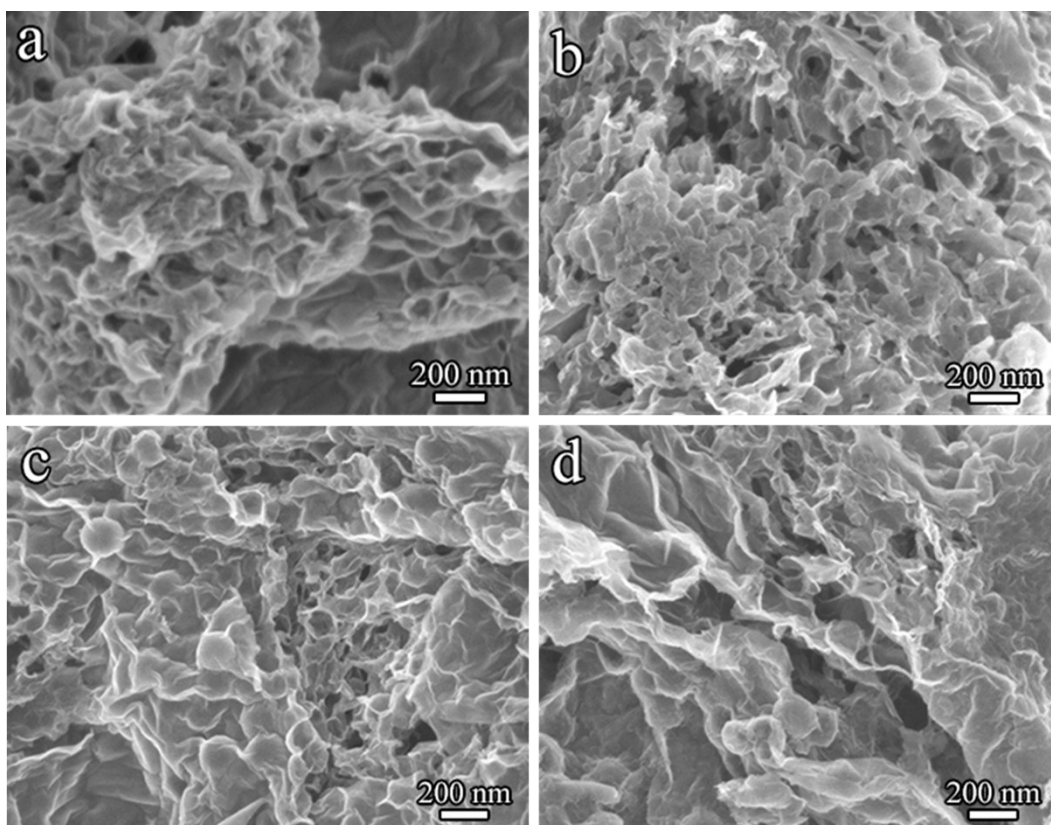


Fig. S3 FESEM images of (a) 3DPG, (b) N-3DPG1, (c) N-3DPG2 and (d) N-3DPG8.

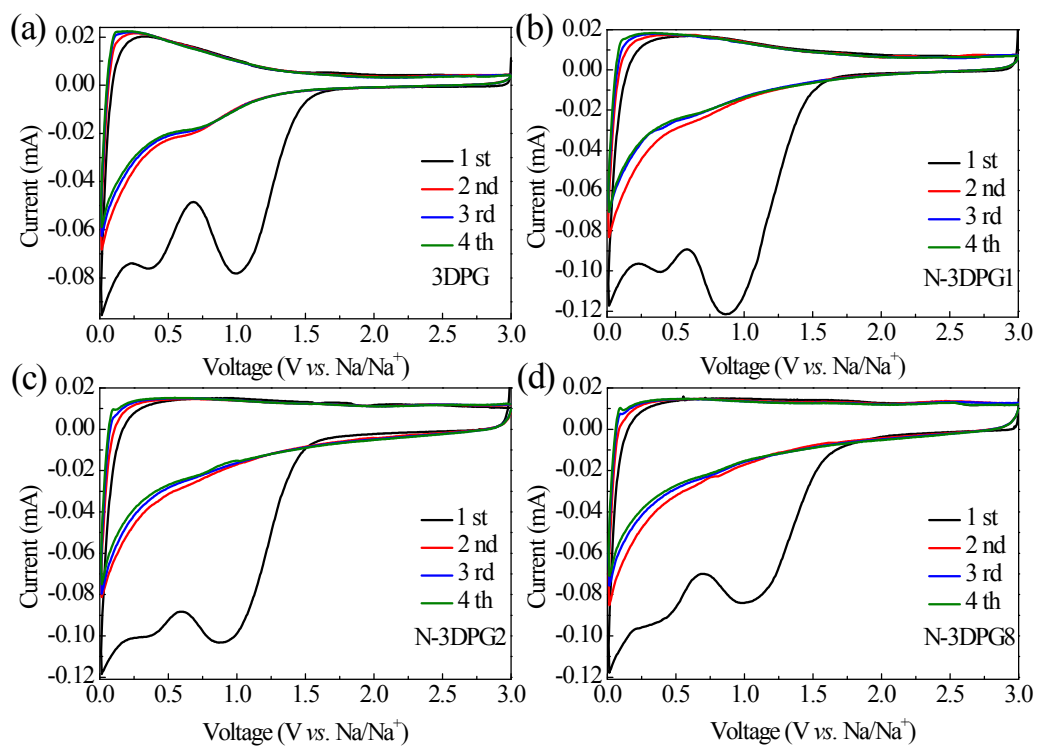


Fig. S4 Cyclic voltammograms curves in the potential range of 0.0–3.0 V vs. Na/Na⁺ at a scan rate of 0.2 mV s⁻¹ for (a) 3DPG, (b) N-3DPG1, (c) N-3DPG2 and (d) N-3DPG8, respectively.

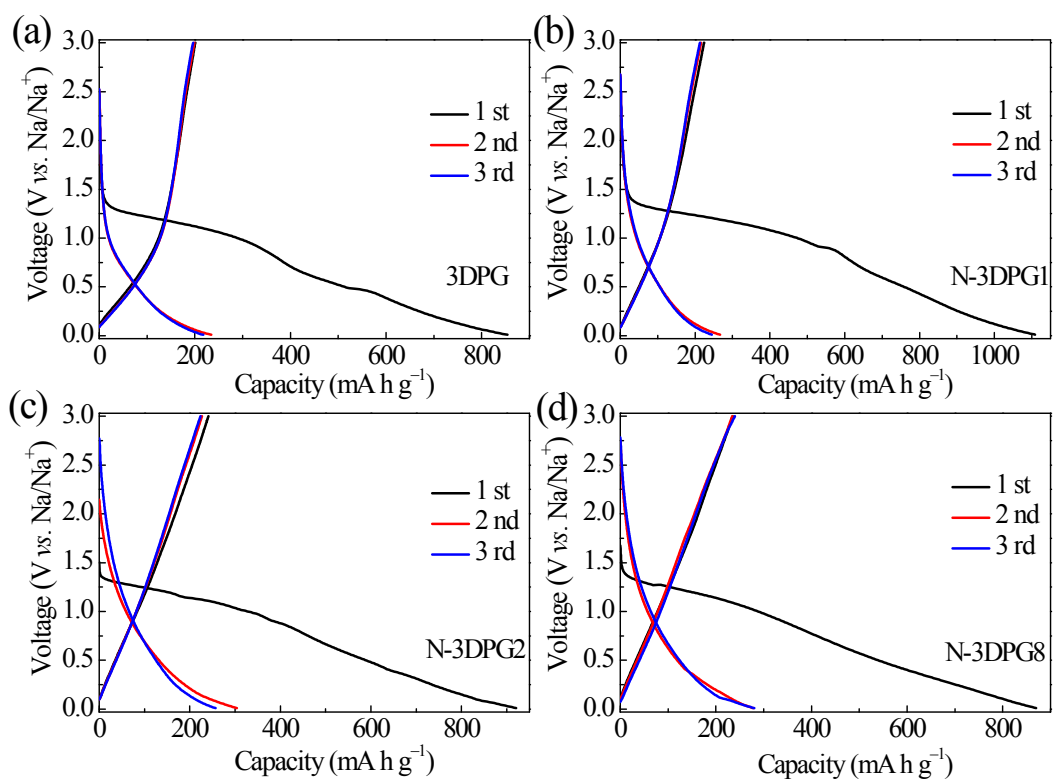


Fig. S5 Galvanostatic charge-discharge profiles at 0.2 A g^{-1} for (a) 3DPG, (b) N-3DPG1, (c) N-3DPG2 and (d) N-3DPG8, respectively.

Table S1 The measured parameters of the samples from XRD and EDS analyses.

| Samples | d_{002} (nm) | C (wt%) | N (wt%) | O (wt%) |
|---------|----------------|------------|------------|------------|
| 3DPG | 0.339 | 94.0 | | 6.0 |
| N-3DPG1 | 0.34 | 73.8 | 18.2 | 8.1 |
| N-3DPG2 | 0.341 | 71.79 | 20.51 | 7.70 |
| N-3DPG4 | 0.341 | 71.43 | 22.35 | 6.22 |
| N-3DPG8 | 0.342 | 69.46 | 20.86 | 9.68 |