Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Three-dimensional nitrogen-doped holey graphene and transition metal oxide composites for sodium-Ion batteries

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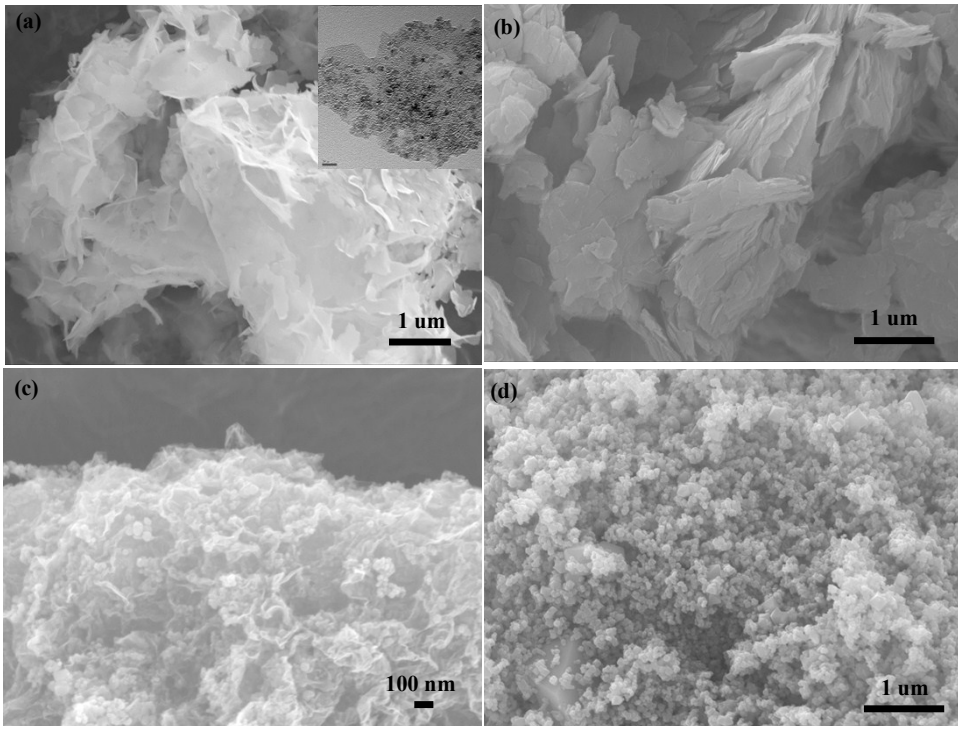

Fig.S1 SEM images of (a) NCO@G (the inset shows its TEM image), (b) NCO, (c) Fe_3O_4@G and (d) Fe_3O_4.

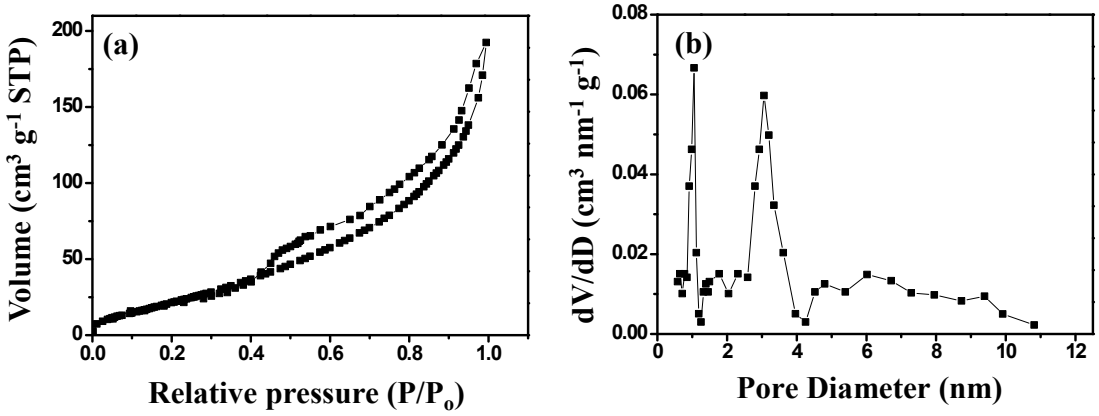

Fig. S2 (a) Argon adsorption/desorption isotherms and (b) DFT pore size distributions of NCO@N-HG.

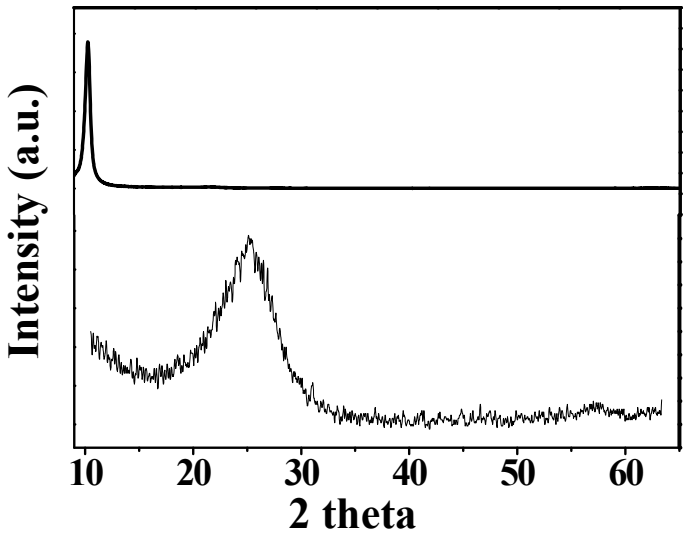

Fig. S3 XRD patterns of GO (top) and N-HG (bottom).

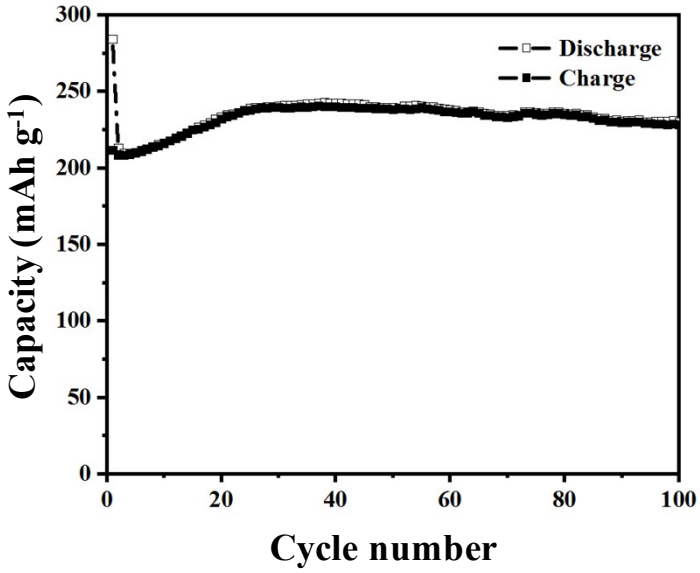

Fig. S4 Cycling performance of N-HG electrode at 0.1 A g^{-1} tested using a NIB cell.

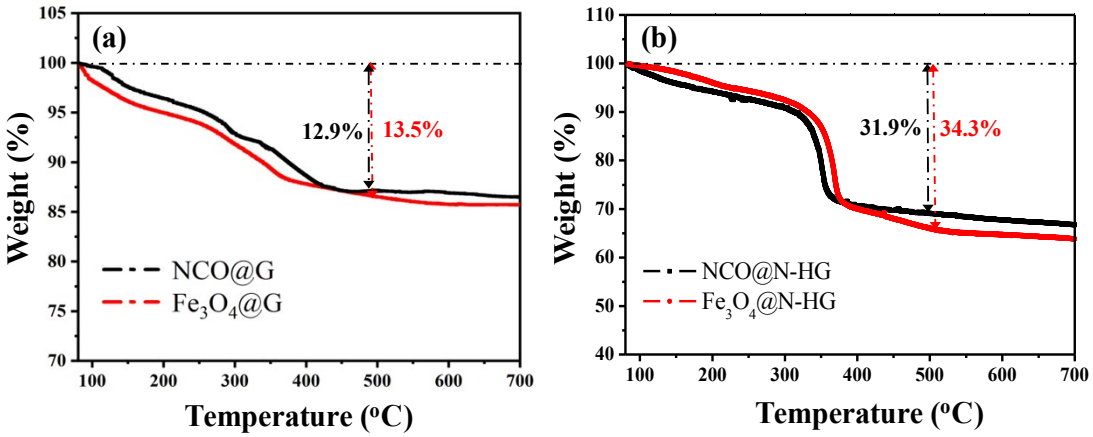

Fig. S5 TGA curves of (a) NCO@G and Fe_3O_4@G, and (b) NCO@N-HG and Fe_3O_4@N-HG in air.

The weight loss below 500 °C was due to the removal of the graphene in the composite materials. In the temperature range between 500 to 700 °C, both samples showed minor weight loss, which was probably due to weight loss from NCO or Fe_3O_4.[1,2]

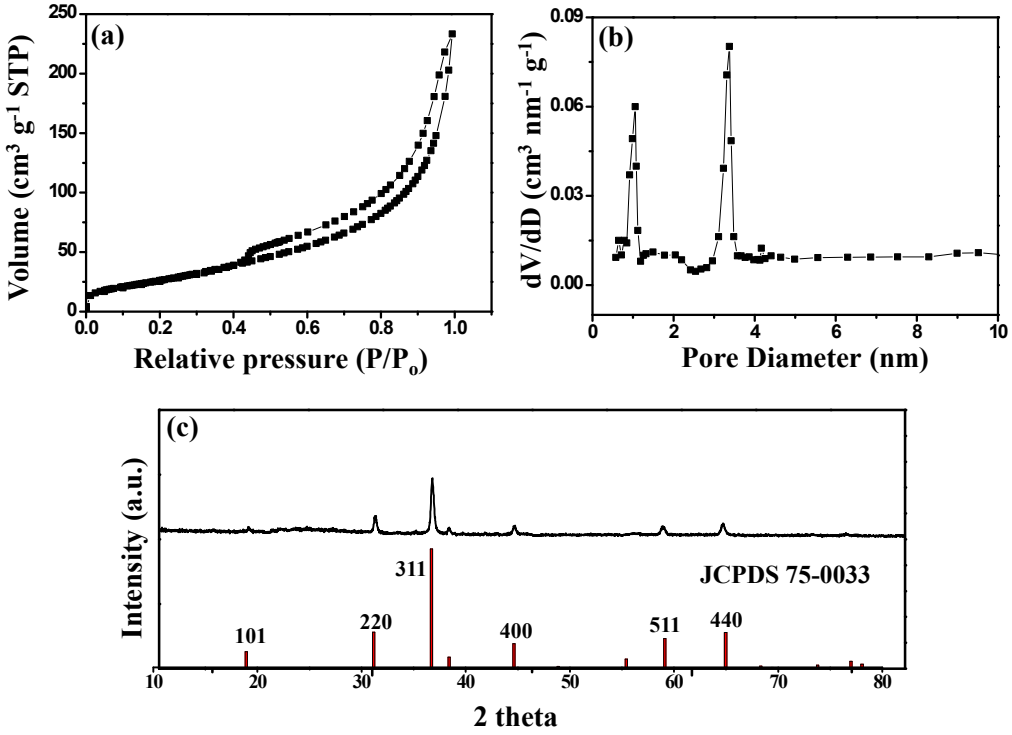

Fig. S6 (a) Argon adsorption/desorption isotherms, (b) DFT pore size distributions of Fe_3O_4@N-HG. (c) XRD patterns for Fe_3O_4@N-HG and the standard Fe_3O_4 (JCPDS card no. 75-0033).

References:

1. Chi, B.; Li, J.; Han, Y.; Chen, Y. *Int. J. Hydrog. Energy*, 2004, **29**, 605–610.
2. Ayyappan, S.; Gnanaprakash, G.; Panneerselvam, G.; Antony, M. P.; Philip, J. *J. Phys. Chem. C* 2008, **112**, 18376–18383.