Tannic Acid Mediated Synthesis of Dual-heteroatom Doped Hollow Carbon from Metal-Organic Framework for Efficient Oxygen Reduction Reaction

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Equation S1: $1/j=1/j_k+1/B\omega^{0.5}$

Equation S2: $B=0.62nFC(D)^{2/3}v^{-1/6}$

where j is the measured current density, j_k is the kinetic-limiting current density, B is the Levich slope, ω is the rotation speed, n is the overall number of electrons transferred in the ORR, F is Faraday's constant, C is the bulk concentration of O_2 in the electrolyte, D is the diffusion coefficient of O_2, and ν is the kinematic viscosity of the electrolyte.

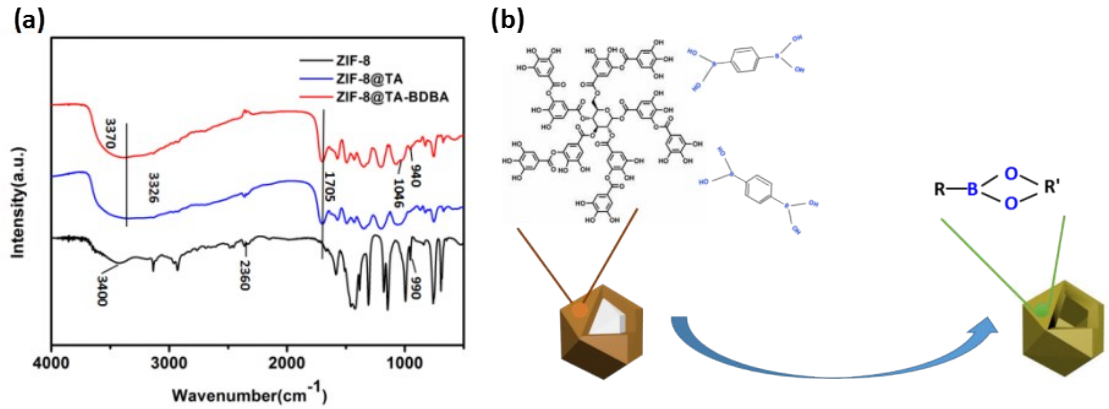


Fig. S1(a)FTIR spectra of ZIF-8, ZIF-8@TA and ZIF-8@TA-BDBA. (b)Schematic illustration on synthetic interaction between boron acid and polyols in TRIS buffer.

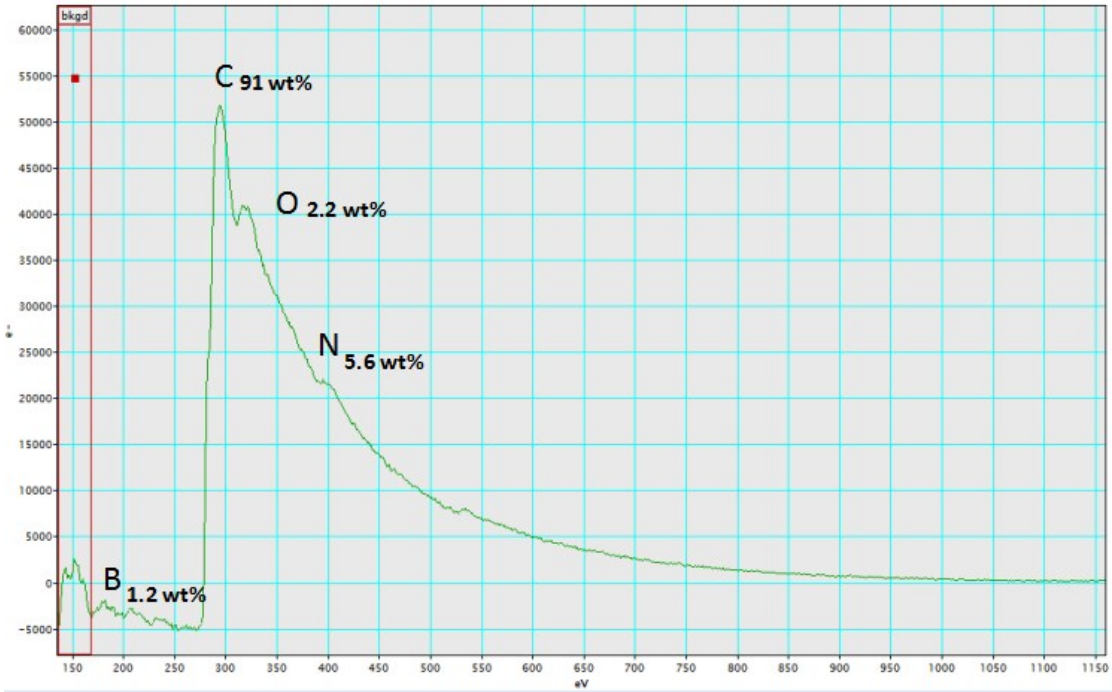


Fig.S2 EDS spectrum of NB-HC.

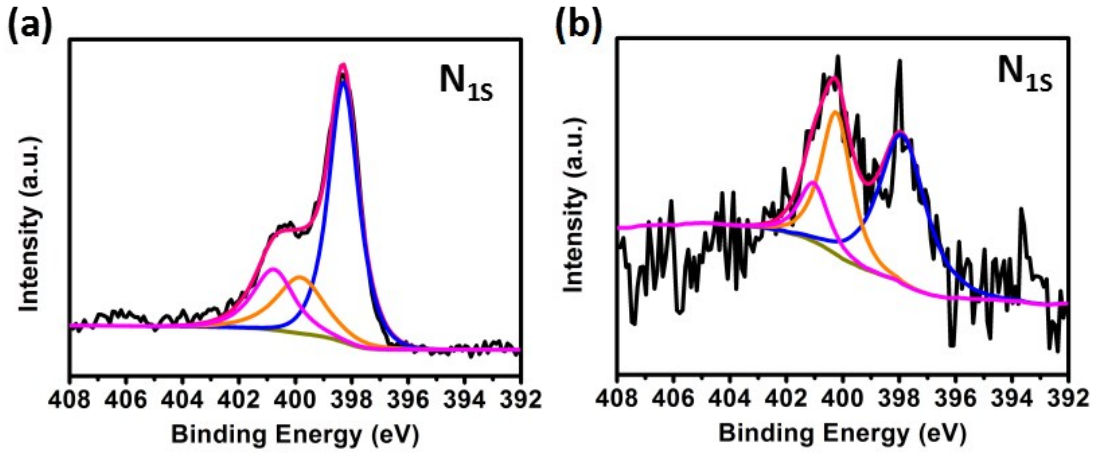


Fig. S3 High-resolution XPS of N1s of (a)N-C and (b) N-HC.

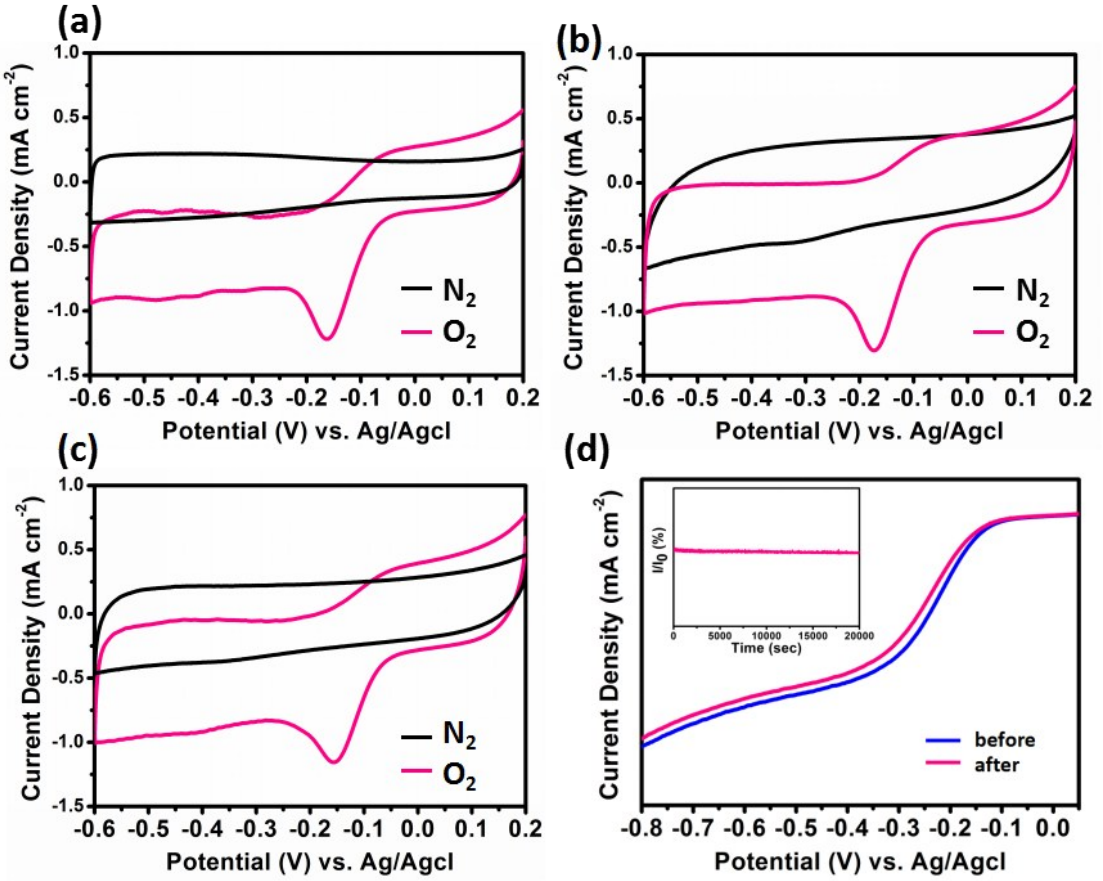
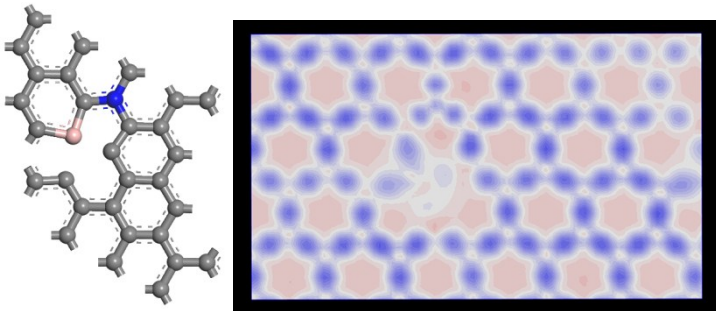
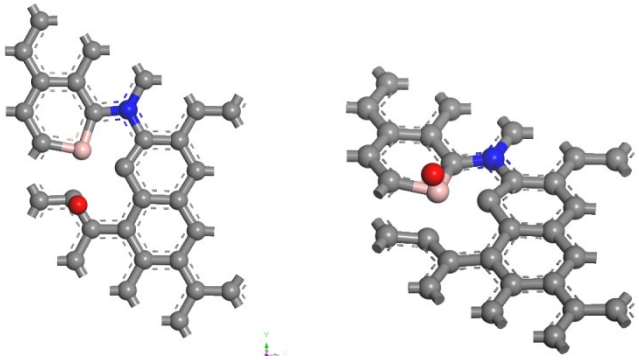


Fig. S4 Cyclic voltammograms for ORR in O_2 or N_2 saturated 0.1 M KOH at a scan rate of 10 mV $s^{-1}$of (a) N-C, (b) N-HC, and (c)NB-HC electrode.(d)LSV of NB-HC before and after 10000cycles at a scan rate of 100 mV s^{-1}.

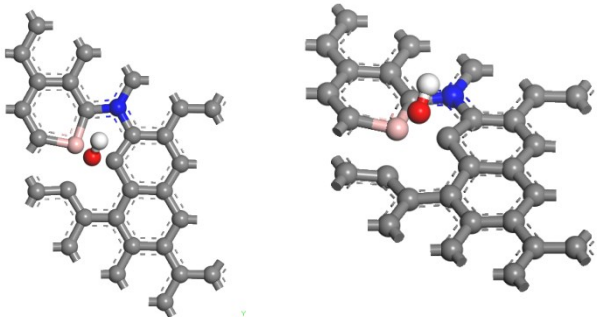
g-N-B



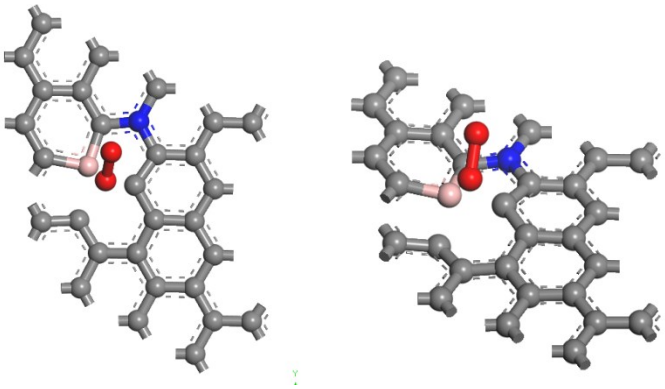
***O**



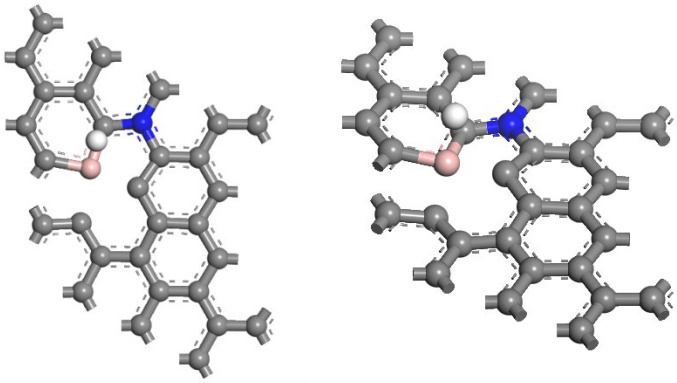
***OH**



***O_2**



***H**



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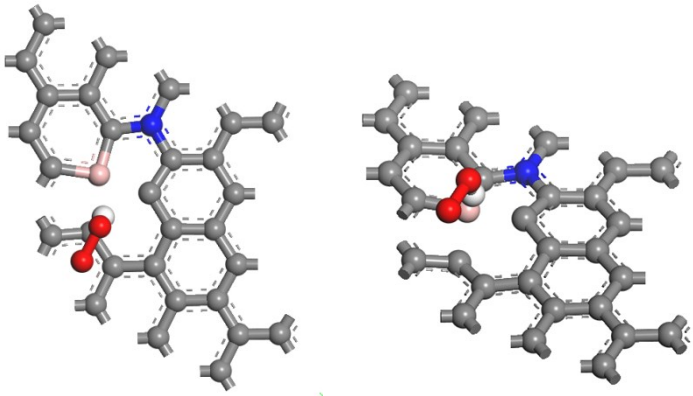

Fig. S5 Calculation model and optimized structures for the stable adsorbed intermediate products on the N/B-codoped nanocarbon.

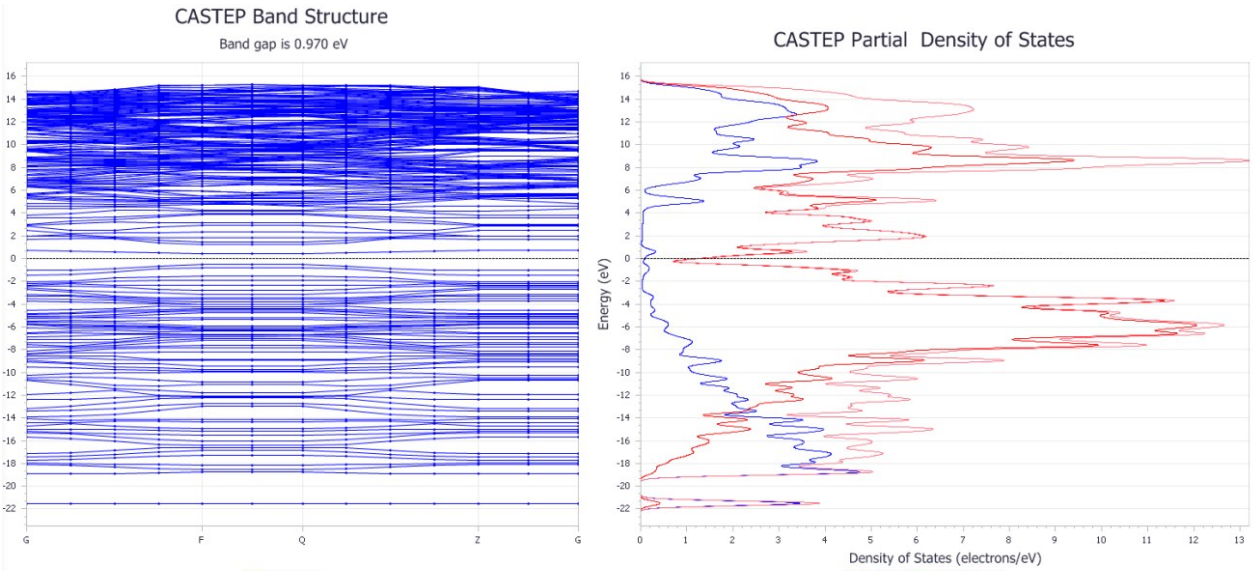

Fig. S6 The corresponding band structure and partial density states.