

Supporting information

N-doped carbon nanocages with high catalytic activity and durability
for oxygen reduction

Xiao Xia Wang, Biao Zou, Xin Xin Du, and Jian Nong Wang*

Nano-X Research Center, School of Mechanical and Power Engineering,
East China University of Science and Technology,
130 Meilong Road, Shanghai 200237,
P. R. China.

Tel: +86-21-64252360. E-mail: jnwang@ecust.edu.cn

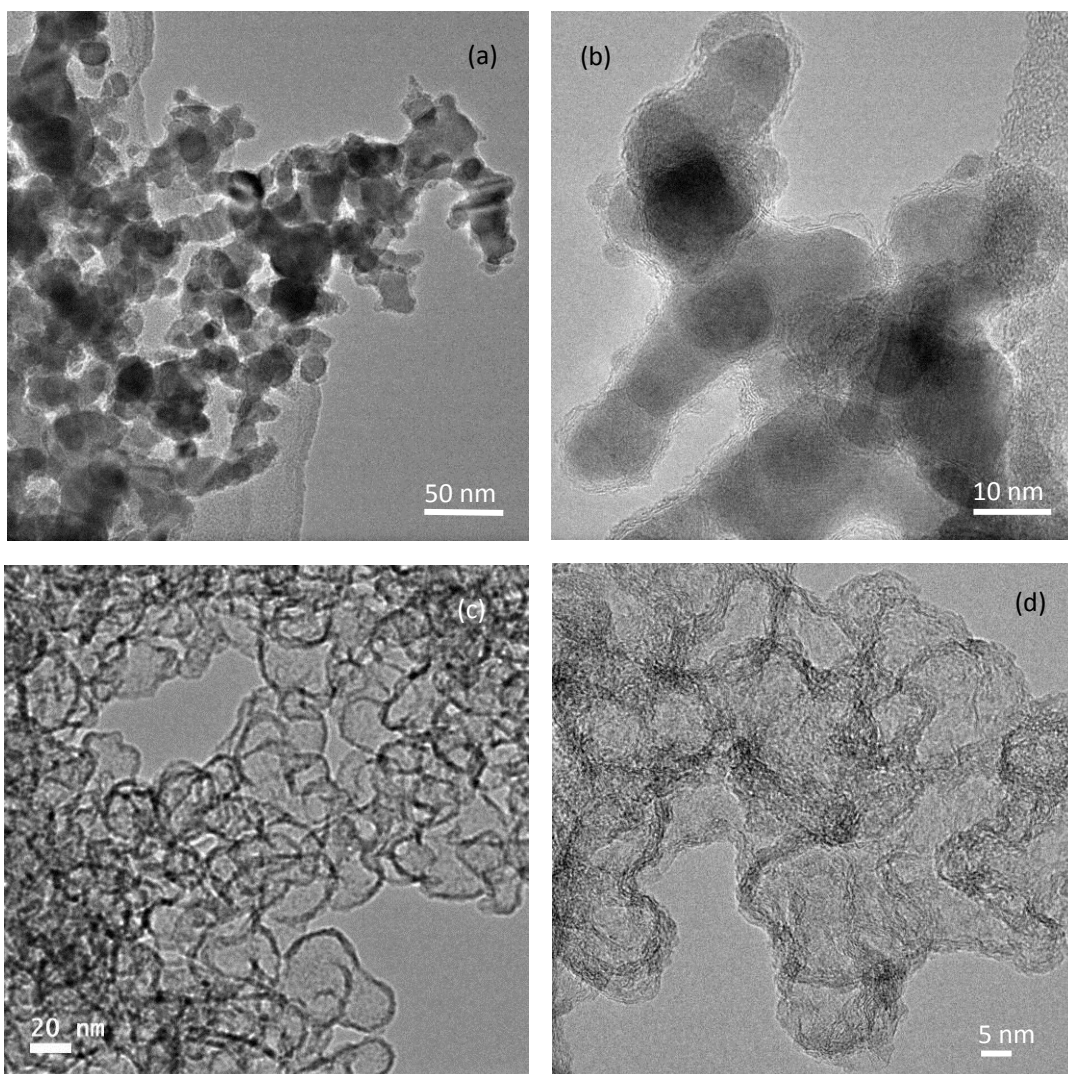


Fig. S1. TEM images of the as-prepared NCNC at 500 °C before acid washing (a, b), and NCNC5-800 (c, d)

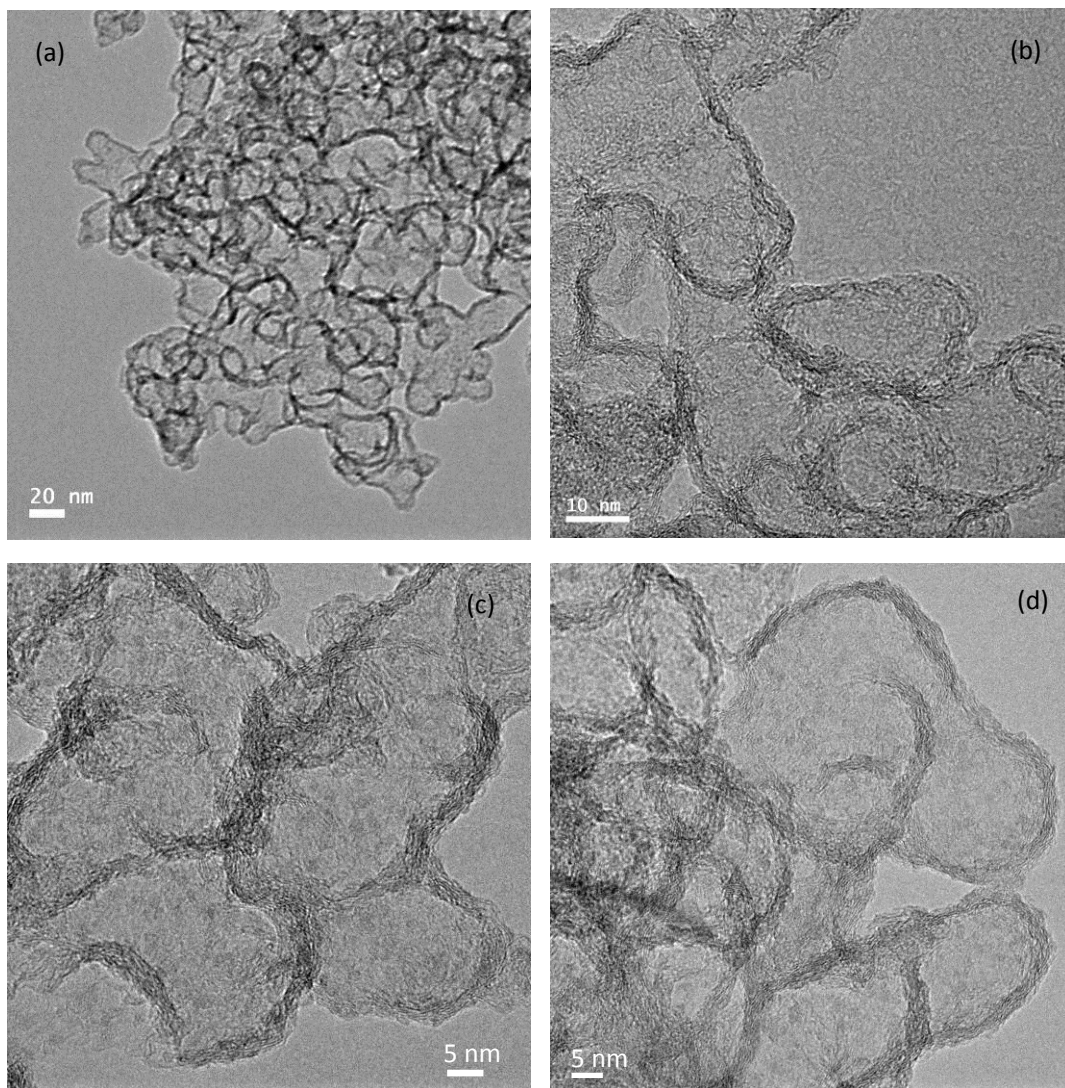


Fig. S2. TEM images of NCNC6 (a, b) and NCNC6-800 (c, d)

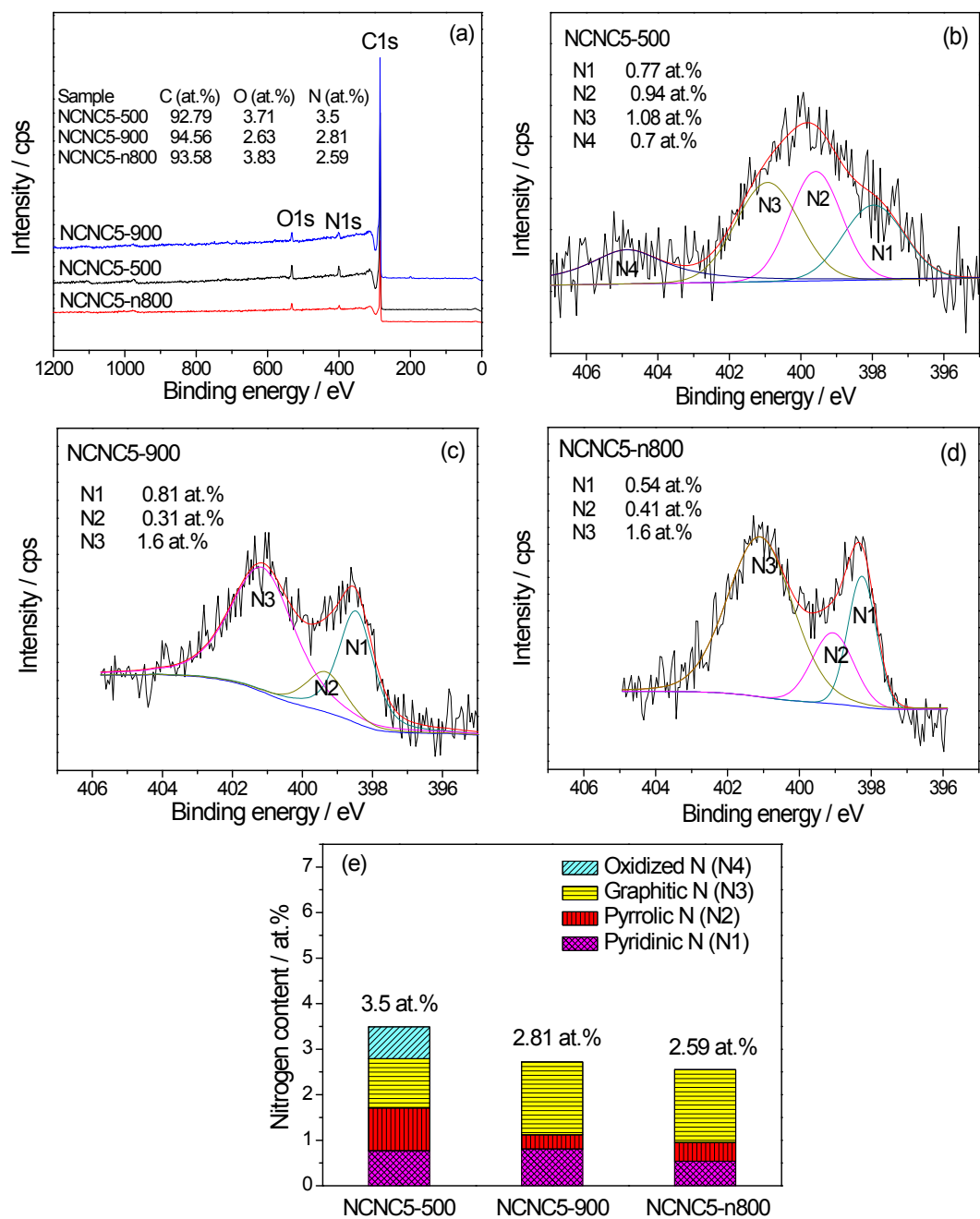


Fig. S3. XPS survey spectra of different samples (a), high resolution N 1s spectra of NCNC5-500 (b), NCNC5-900 (c), and NCNC5-n800 (d), and the contents of different types of N in different NCNCs (e).

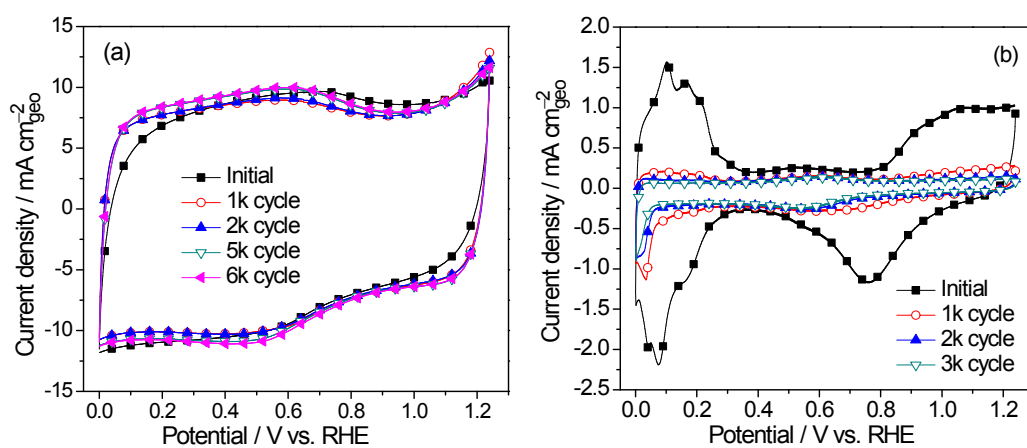


Fig. S4 Cyclic voltammogram curves of NCNC5-800 (a), and JM catalysts (b) after different numbers of potential cycling between 0.6 and 1.24 V (vs. RHE)

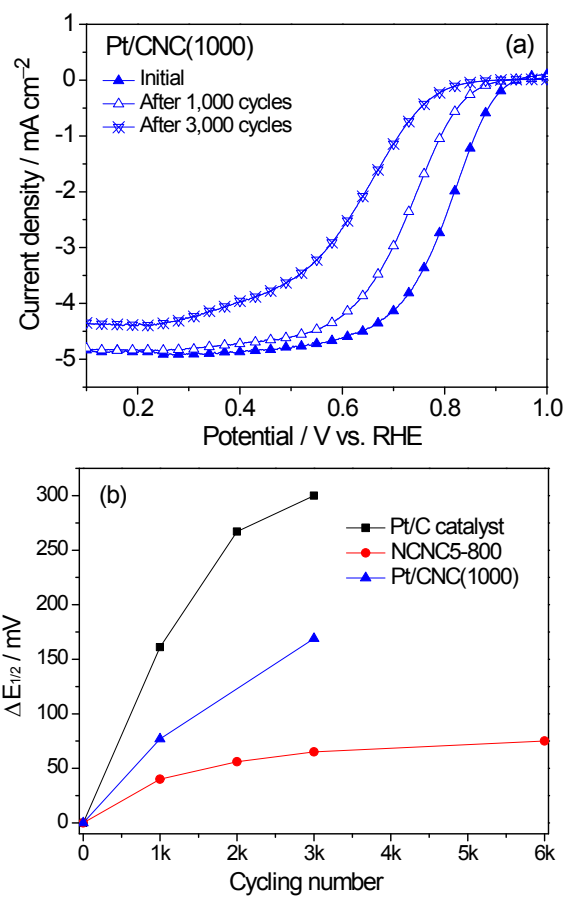


Fig. S5. RDE polarization curves of Pt/CNC(1000) (a) before and after potential cycling between 0.6 to 1.24 V (vs. RHE) in O₂-saturated 0.5 M H₂SO₄, and the difference between initial E_{1/2} and E_{1/2} after different numbers of potential cycling (b).

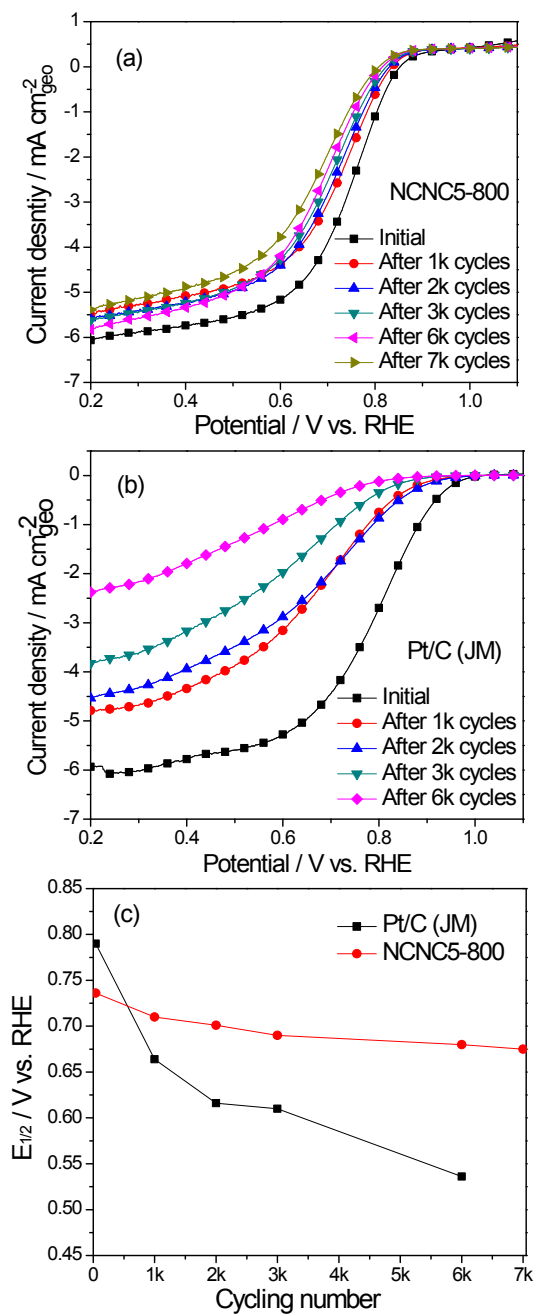


Fig. S6. RDE polarization curves of NCNC5-800 (a) and JM (b) catalysts before and after potential cycling between 0.66 to 1.3 V (vs. RHE) in O₂-saturated 0.1 M HClO₄, (rotating speed: 1600 rpm, scan rate: 5 mV s⁻¹), and the variation of half-wave potential with the cycling number for NCNC5-800 and JM Pt/C catalyst (c).

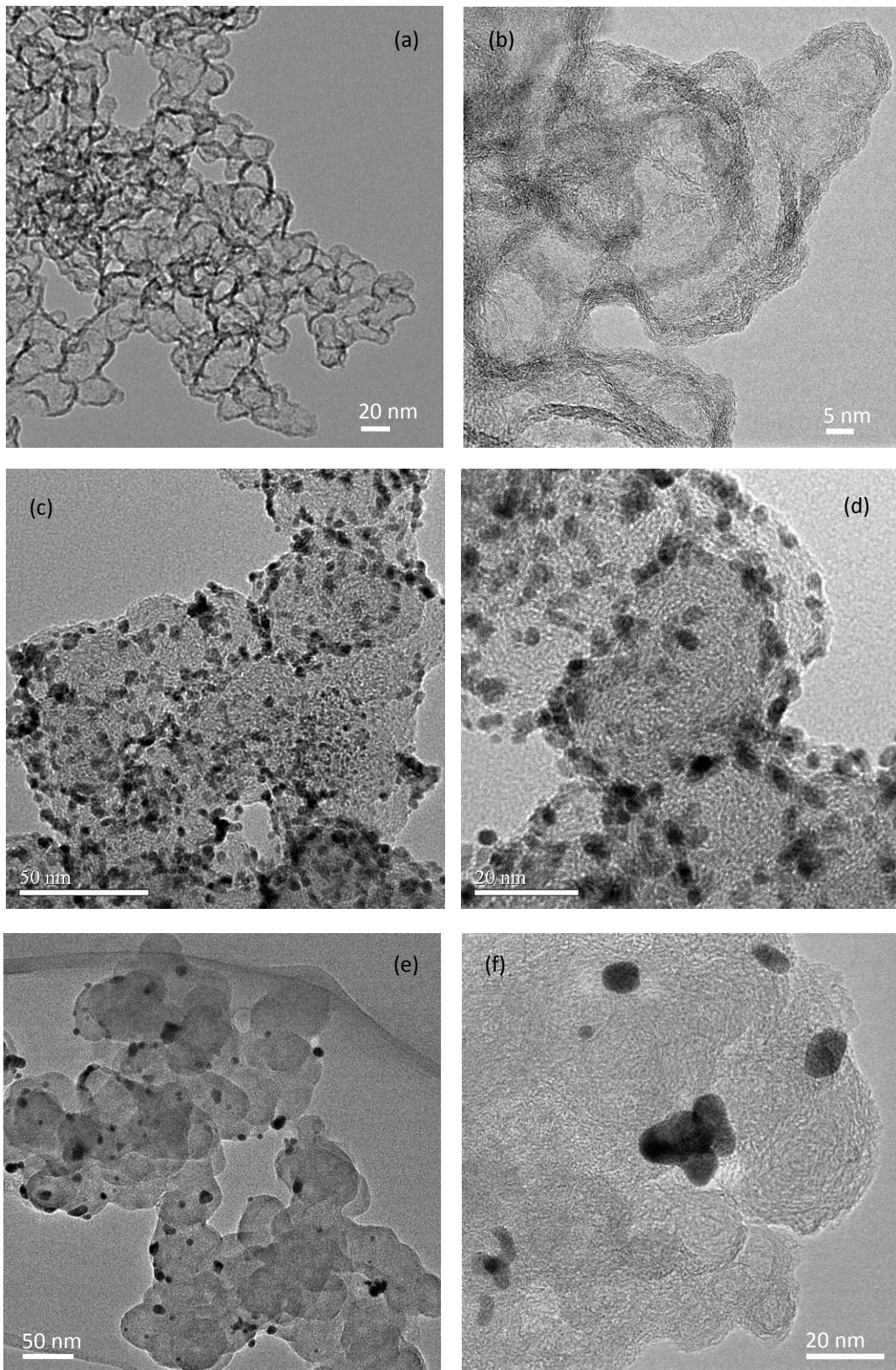


Fig. S7. TEM images of NCNC5-800 after 7000 potential cycles in 0.1 M HClO₄ (a, b), TEM images of Pt/C before (c, d) and after 6000 potential cycles (e, f)

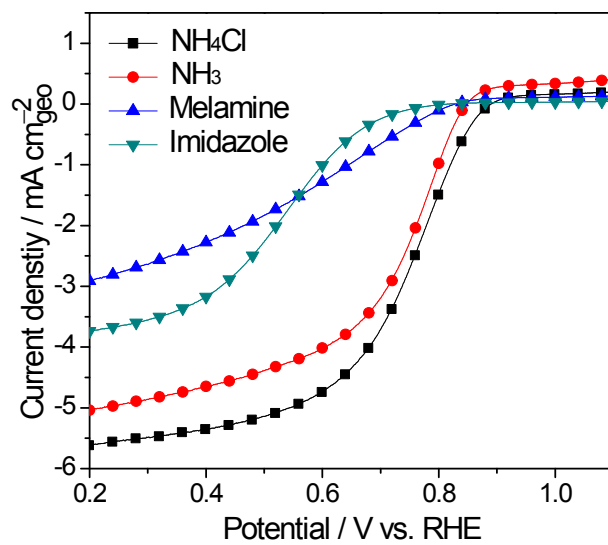


Fig. S8. RDE polarization curves of NCNC5 heated at 800 °C with different N-containing chemicals in O₂-saturated 0.1 M HClO₄ (rotating speed: 1600 rpm, scan rate: 5 mV s⁻¹).