

Supporting Information

**Novel Carbon Structure as Highly Stable Support for
Electro-catalyst in Acid Media: Regulating Oxygen
Functionalization Behavior of Carbon**

Guokang Han^a, Yongrong Sun^b, Yuxin Liu^a, Lingfeng Li^a, Xudong Li^a, Chunyu Du^{*, a}
and Geping Yin^a

^a MIIT Key Laboratory of Critical Materials Technology for New Energy Conversion and Storage, School of Chemistry and Chemical Engineering, Harbin Institute of Technology, Harbin, 150001 China

^b Biomaterials Engineering Technology Research Center, Institute of Bioengineering, Guangdong Academy of Sciences, Guangzhou, 510316 China

* Corresponding Author: Chunyu Du (Email: cydu@hit.edu.cn)

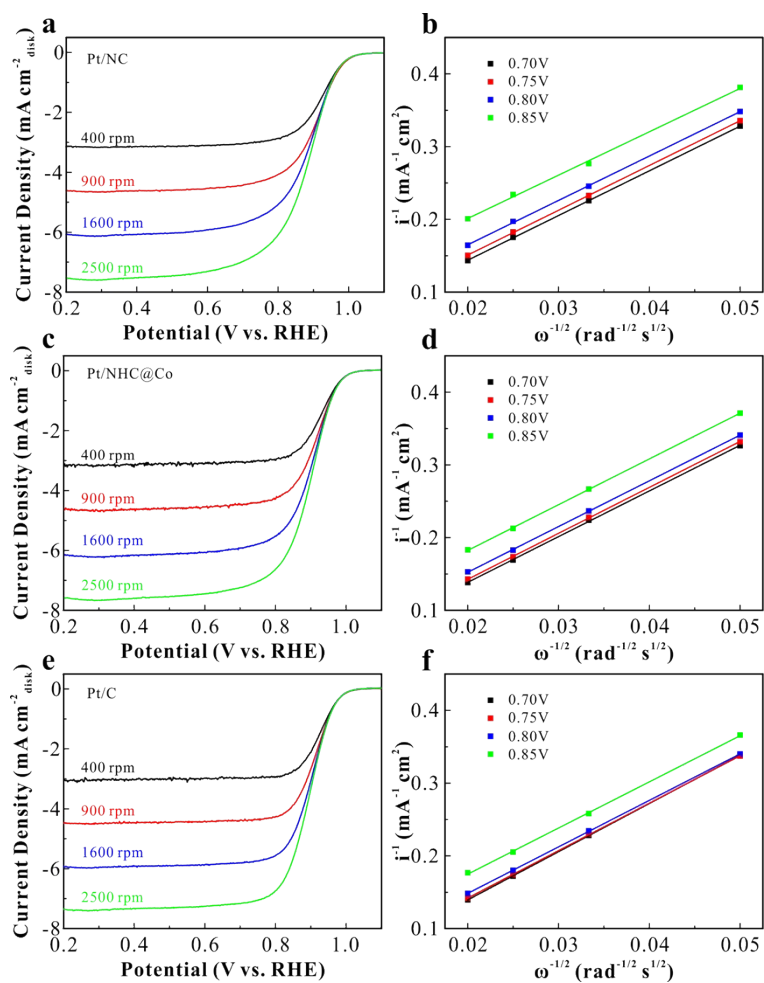


Fig. S1 ORR polarization curves at different rotating rate for (a) Pt/NC, (c) Pt/NHC@Co and (e) commercial Pt/C, and (b,d,f) corresponding K-L plots

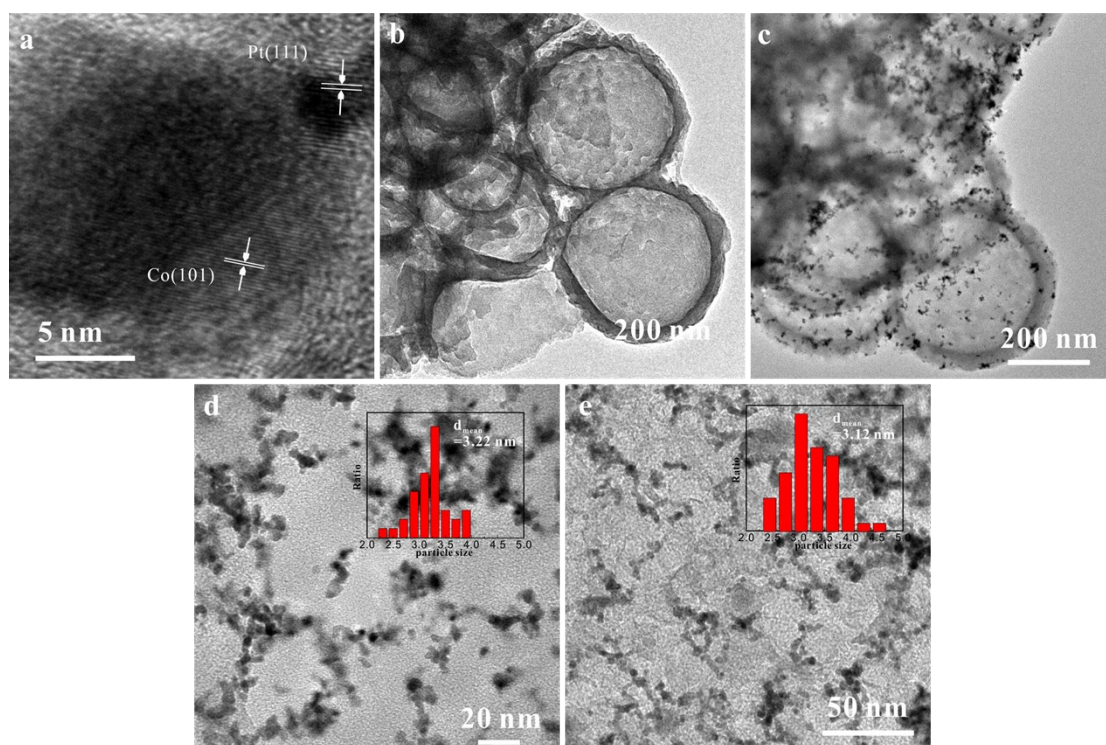


Fig. S2 (a) HRTEM image of Pt/NHC@Co, TEM images of (b) NC and (c) Pt/NC. TEM images and corresponding particle size distribution diagram of (d) Pt/NC and (e) Pt/NHC@Co.

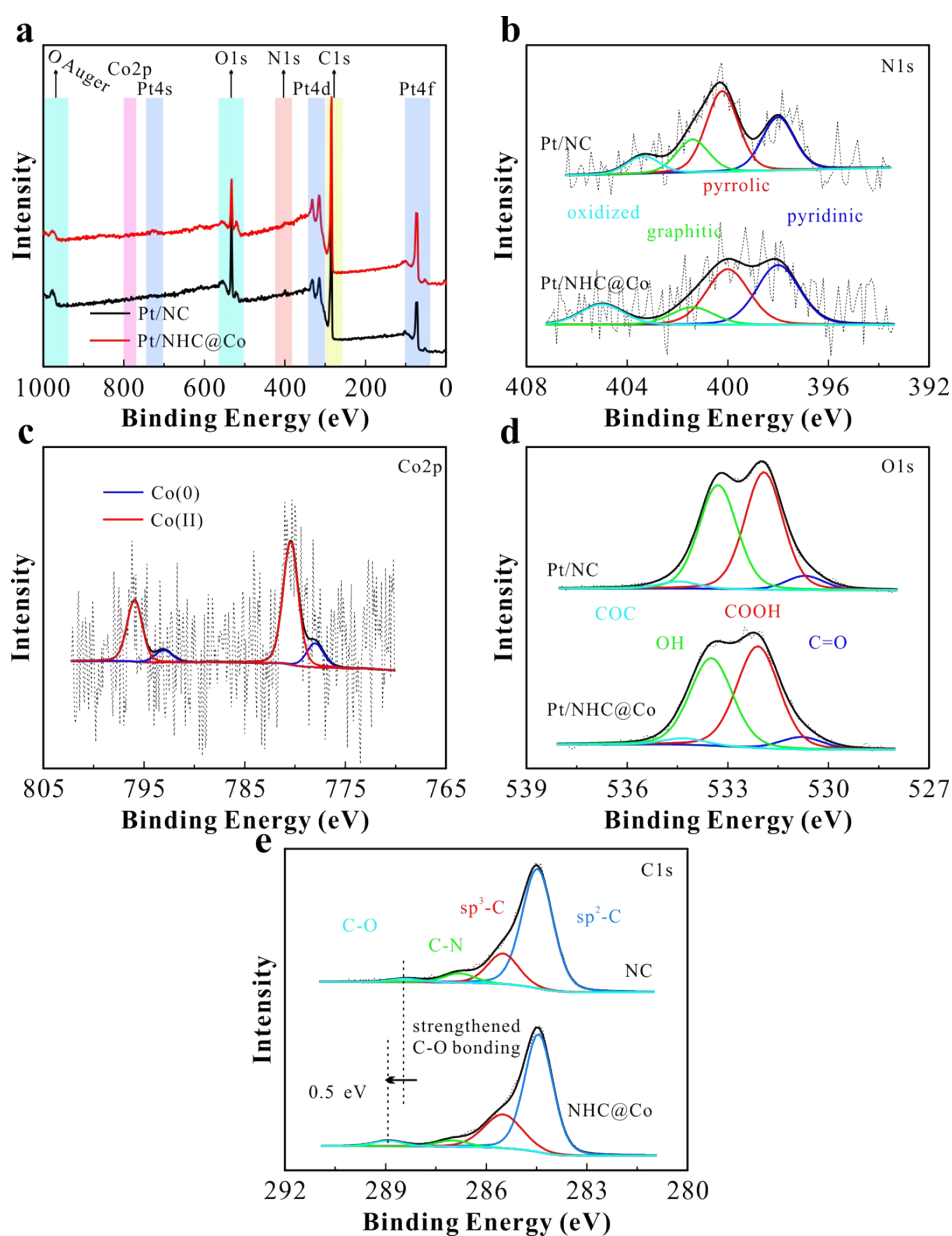


Fig. S3 (a) XPS survey spectra, (b) N1s spectra for Pt/NC and Pt/NHC, (c) Co 2p spectrum for Pt/NHC@Co, (d) O 1s spectra for Pt/NC and Pt/NHC, (e) C 1s spectra for NC and NHC

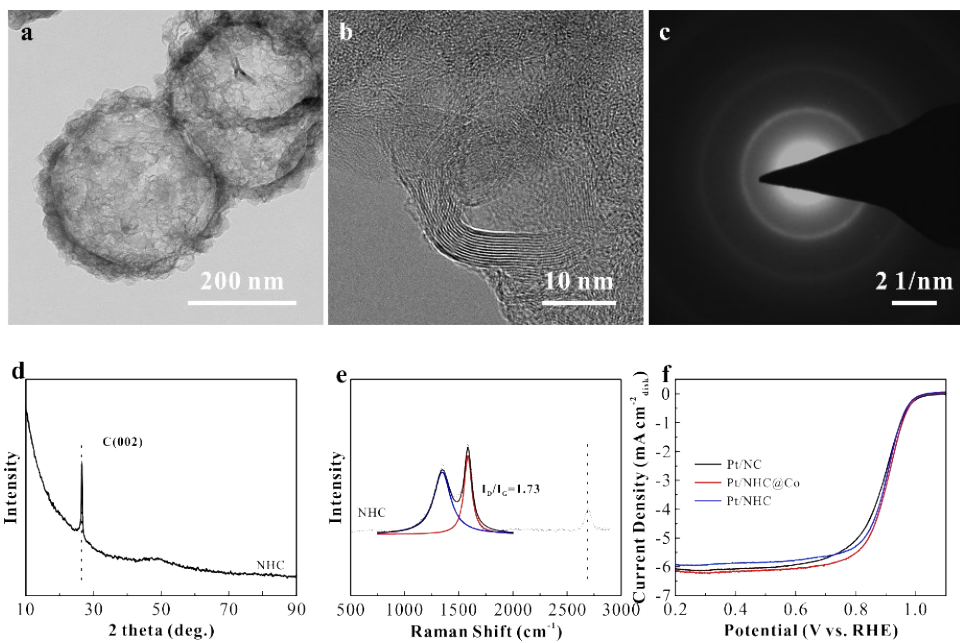


Fig S4 (a-b) TEM images of NHC, (c) SAED pattern, (d) XRD pattern and (e) Raman spectra of NHC, (f) ORR polarization curves of Pt/NHC compared with Pt/NC and Pt/NHC@Co

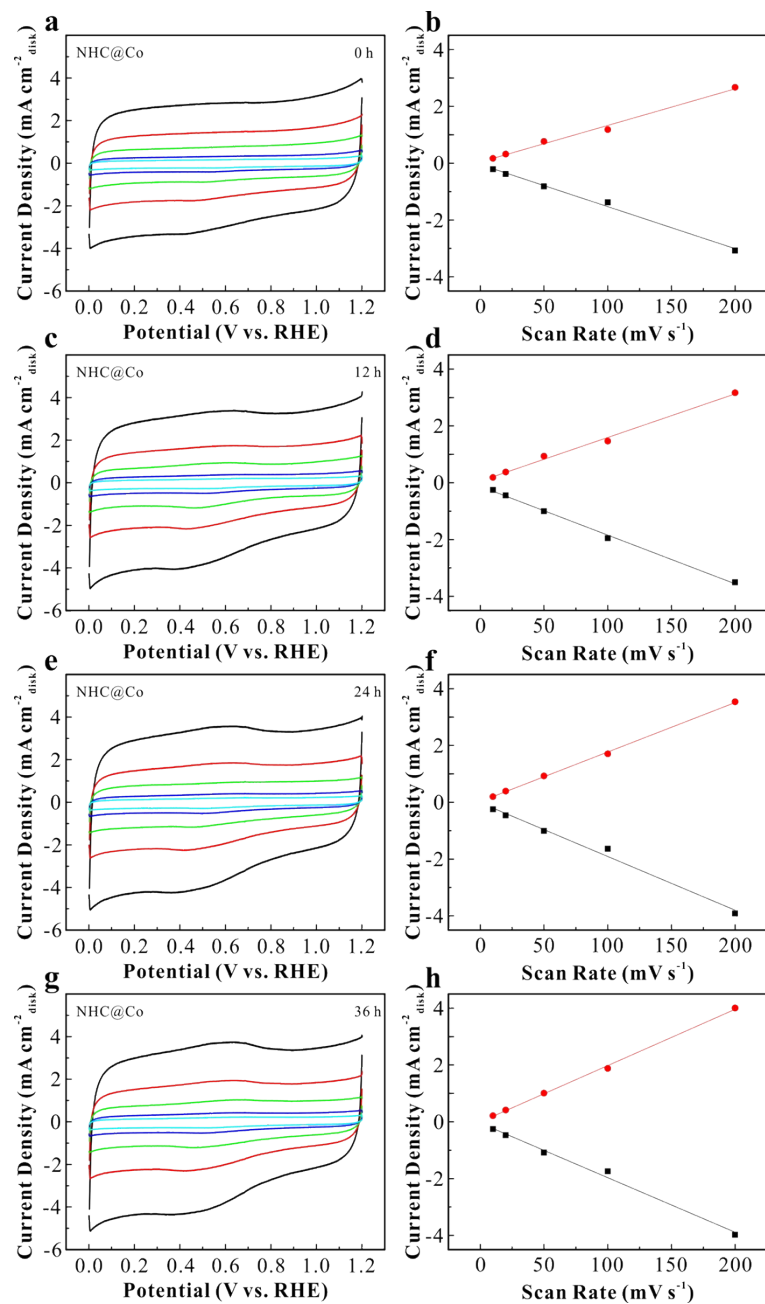


Fig. S5 CV curves at different scan rate of (a) original NHC@Co and after (c) 12 h, (e) 24 h and (g) 36 h potential scan. (b,d,f,h) Relationship of current density at 0.6 V with scan rate of NHC@Co at corresponding conditions.

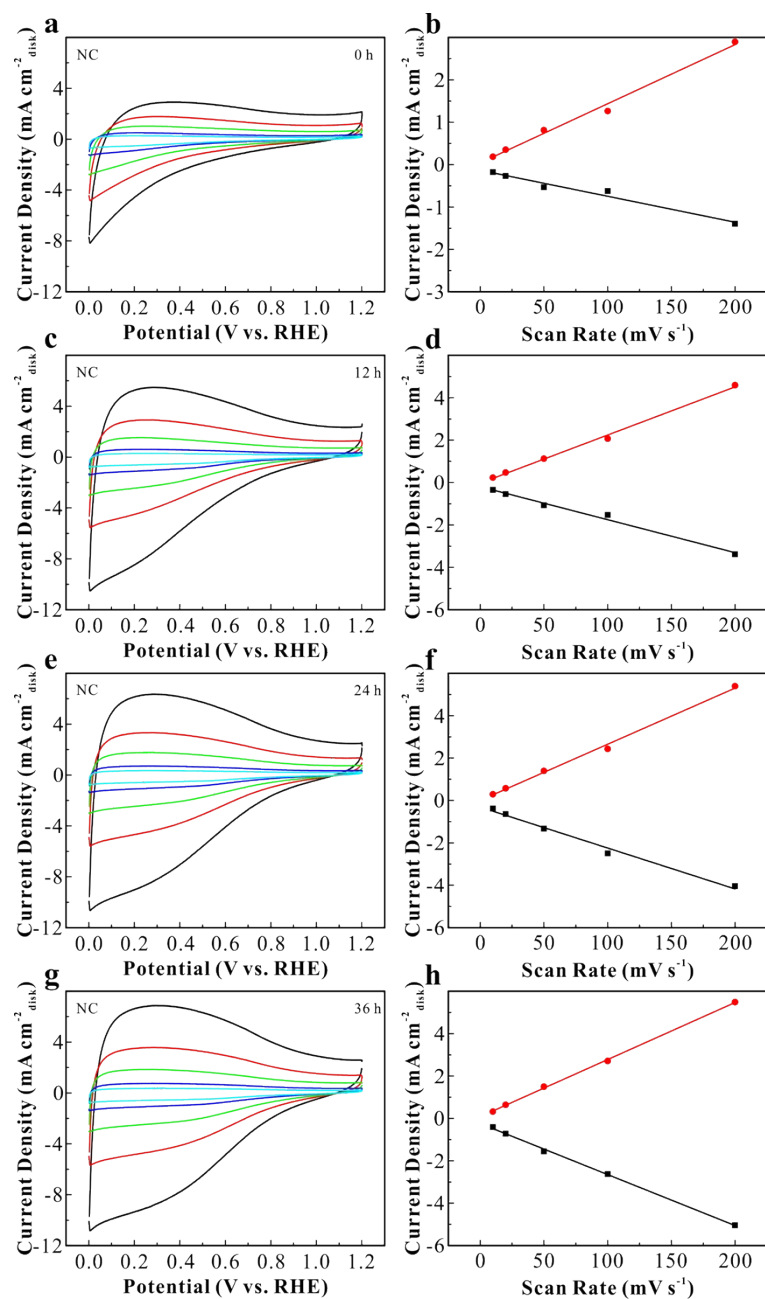


Fig. S6 CV curves at different scan rate of (a) original NC and after (c) 12 h, (e) 24 h and (g) 36 h potential scan. (b,d,f,h) Relationship of current density at 0.6 V with scan rate of NHC@Co at corresponding conditions.

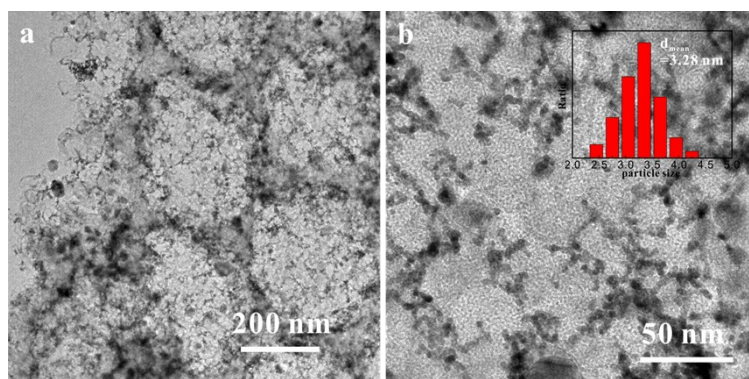


Fig. S7 TEM images of Pt/NHC@Co after ADTs and corresponding particle size distribution diagram.