

Supporting Information

One-pot synthesis of nitrogen and phosphorus-dual-doped carbon nanotube array as highly effective electrocatalyst for oxygen reduction reaction

Jinliang Zhu^a, San Ping Jiang^{*,b}, Ruihong Wang^c, Keying Shi^c and Pei Kang Shen^{*,a}

^a State Key Laboratory of Optoelectronic Materials and Technologies, and Key Laboratory of Low-carbon Chemistry & Energy Conservation of Guangdong Province, School of Physics and Engineering, Sun Yat-sen University, 135 Xingang Road, Guangzhou, 510275, PR China

^b Fuels and Energy Technology Institute & Department of Chemical Engineering, Curtin University, Perth, WA6102, Australia.

^c Key Laboratory of Functional Inorganic Material Chemistry, Ministry of Education of the People's Republic of China, Heilongjiang University, Harbin, 150080, P. R. China.

Additional data:

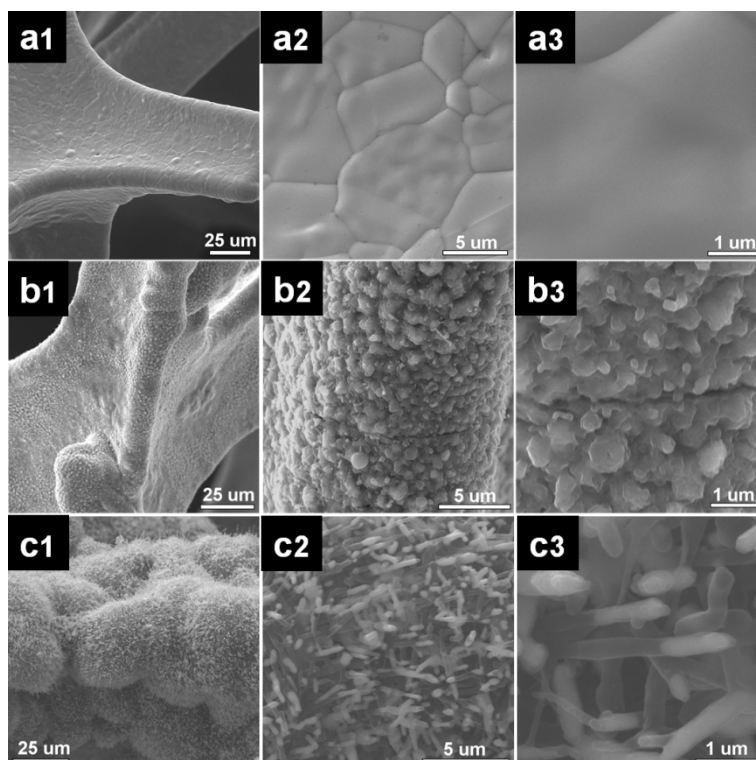


Fig. S1 SEM images of growing N, P-CNTs at different stages. (a1-a3, initial Ni foam substrate, b1-b3, Ni foam at 850 °C for 1 min, c1-c3, Ni foam at 850 °C for 15 min)

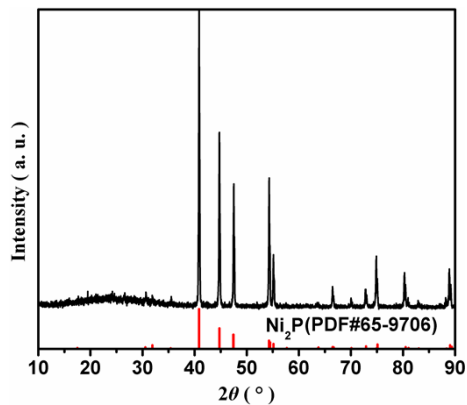


Fig. S2 XRD pattern of the products collected in the second stage (1 min at 850 °C). It confirms the formation of Ni₂P.

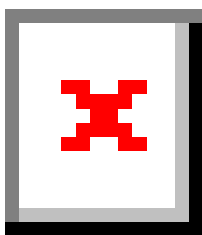


Fig. S3 SEM (side view) image of the N, P-CNTs.

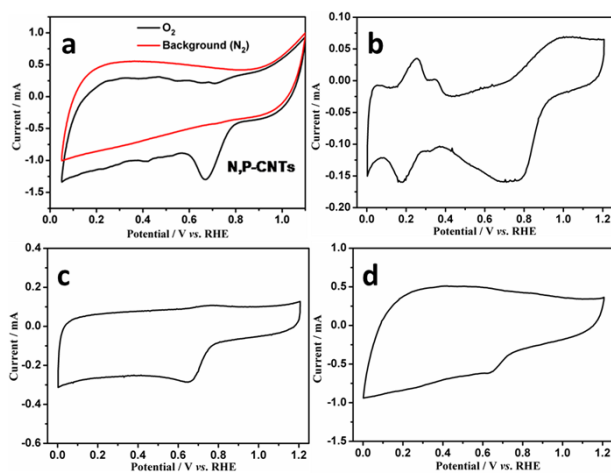


Fig. S4 (a) CV curves of the N, P-CNTs in N₂-saturated and O₂-saturated 0.1 mol L⁻¹ KOH, and (b-d) CV curves of the Pt/C (b), CNTs (c) and N-CNTs (d) in O₂-saturated 0.1 mol L⁻¹ KOH with a sweep rate of 50 mV s⁻¹.