Supporting Information

N, S and P-ternary doped carbon nano-pore/tubes composites derived from natural chemicals in the waste sweet osmanthus fruit with superior activity for oxygen reduction in acidic and alkaline media

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1. Supplemental Table and Figures

Table S1 Main elemental composition, pore size and volume and BET surface area of each synthesized sample.

Samples	EDS (wt.%)					Pore diameter (nm)			Pore volume (cm^3/g)			S_{BET} (m^2/g)
	C	O	N	S	P	$\overline{d}$	Micropore *d*	Mesopore *d*	Total V	Micropore V	Mesopore V	
NSP-NPC	67.33	11.15	0.32	6.39	0.54	3.30	0.44	3.82	0.38	0.18	0.16	462.71
NS-CNPTCs	73.47	3.02	3.54	0.29	-	29.68	0.50	3.82	0.18	0.01	0.07	24.71
NSP-CNPTCs1	68.83	8.14	5.20	0.46	0.53	8.41	0.59	3.83	0.61	0.12	0.30	289.08
NSP-CNPTCs2	74.19	4.36	5.77	0.40	0.34	15.40	0.50	3.69	0.93	0.10	0.47	295.28
NSP-CNPTCs3	70.25	8.79	4.07	0.36	0.39	18.28	0.41	3.82	1.32	0.12	0.71	288.30

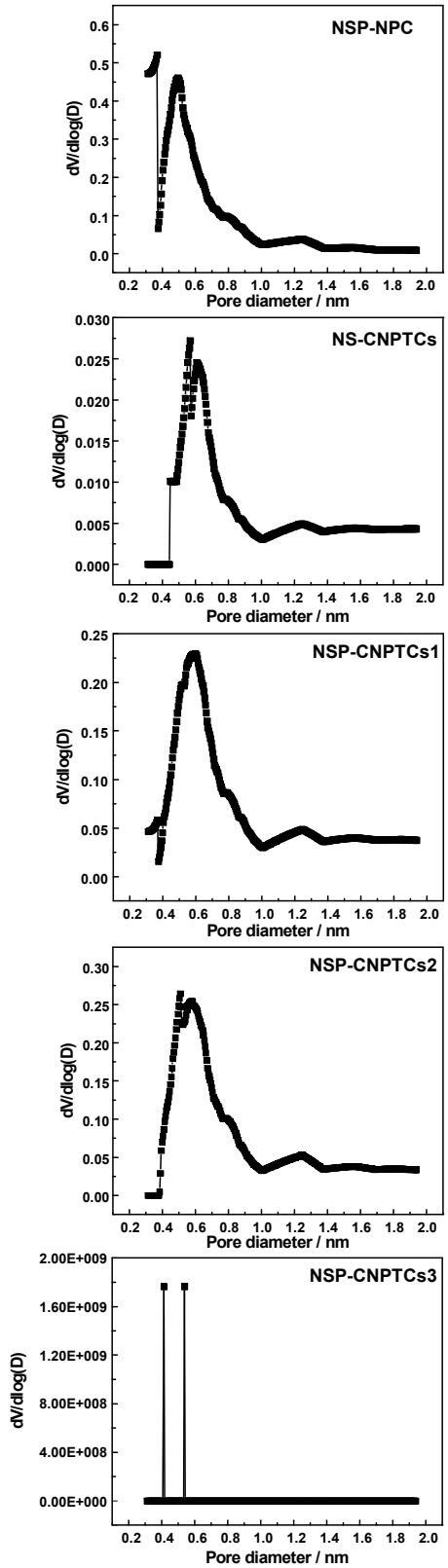

Figure S1. The micro-pore size distributions of the NSP-NPC, NS-CNPTCs, NSP-CNPTCs1, NSP-CNPTCs2 and NSP-CNPTCs3.

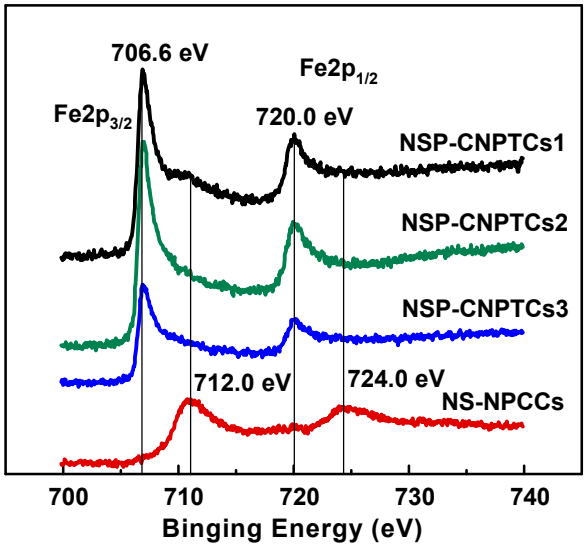

Figure S2. The Fe2p spectra of NS-CNPTCs, NSP-CNPTCs1, NSP-CNPTCs2 and NSP-CNPTCs3.

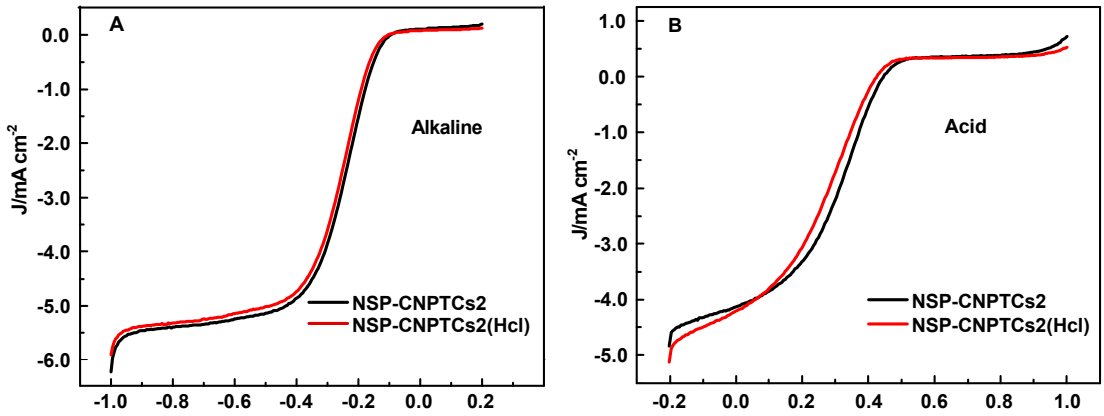

Figure S3. The ORR activity changes of NSP-CNPTCs2 before and after the removing of Fe in NSP-CNPTCs2 in12 M HCl solution for 2 h.

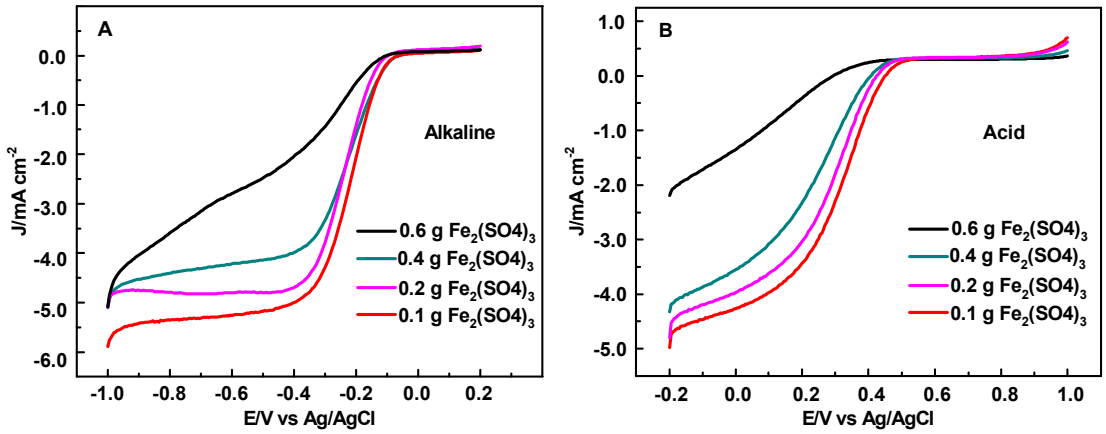

Figure S4. The ORR activities of NSP-CNPTCs synthesized by different amounts of $Fe_2(SO4)_3$ catalysts.