Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Iron-nitrogen co-doped hierarchically mesoporous carbon spheres as highly efficient electrocatalysts for oxygen reduction reaction

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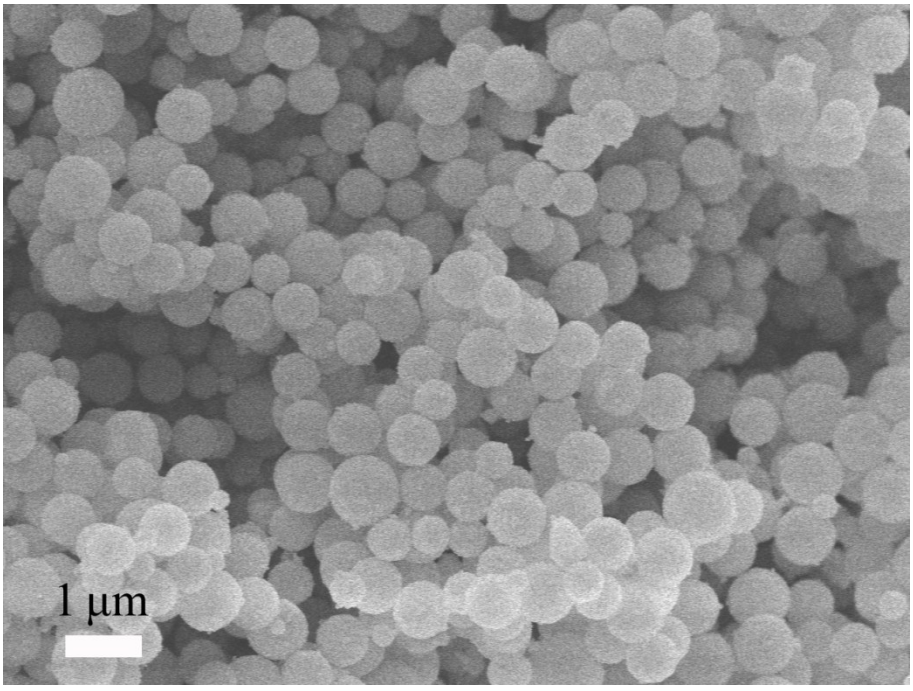

Figure S1 Typical FESEM image of hierarchically mesoporous silica template.

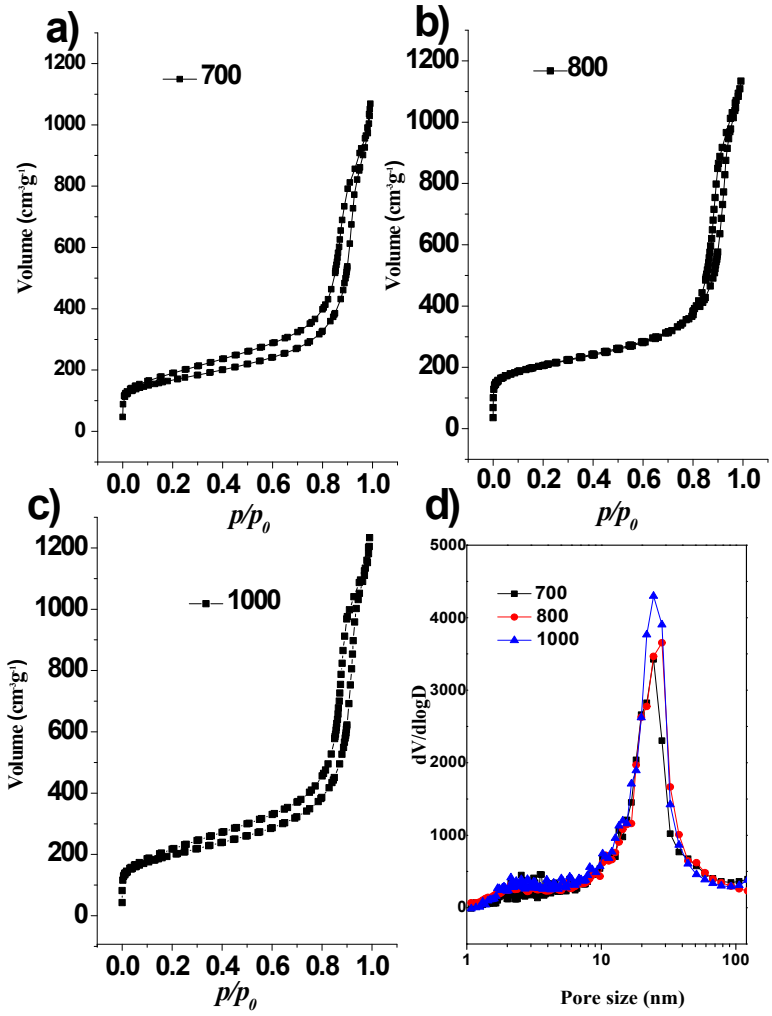

Figure S2. a, b, c) Nitrogen adsorption- desorption isothermsofFe-N-CS-T obtained from different carbonization temperature of 700, 800 and 1000 ^{o}C, respectively. d)Their corresponding pore size distribution curves.

Table S1. BET surface areas, total pore volumes and pore size distribution of Fe-N-CS-Tobtained from different carbonization temperature.

catalysts	T (^oC)[a]	S_{BET} (m^2/g)[b]	V_{tot}(cm^3/g)[c]	d_{meso}(nm)[d]
Fe-N-CS-700	700	602	1.33	24
Fe-N-CS-800	800	724	1.51	28
Fe-N-CS-900	900	758	1.59	28
Fe-N-CS-1000	1000	695	1.63	24
N-CS-900	900	429	1.18	22
Fe-N-CS/SiO_2-900	900	302	0.29	--

[a] Carbonization temperature.

[b] BET specific surface areas obtained from N_2 adsorption isotherm in the range of P/P_0 = 0.05-0.3.

[c] Total pore volume was obtained at P/P_0 of 0.95.

[d]Primary mesopore diameter calculated from BJH method.

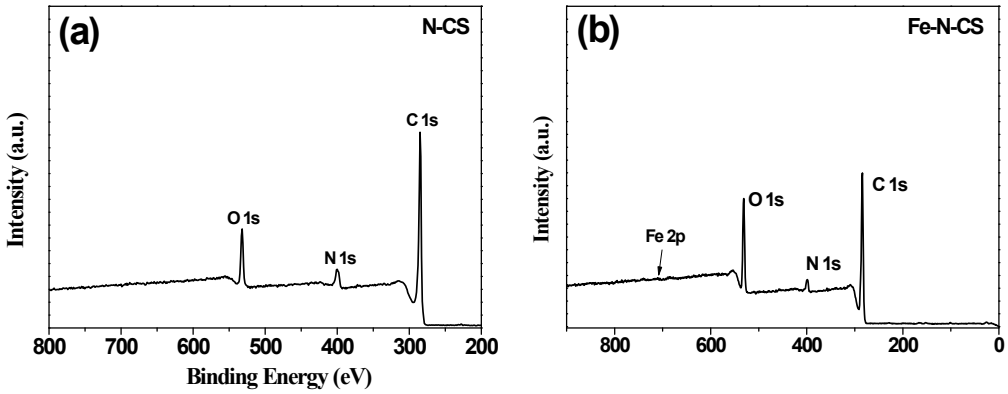

Figure S3 XPS survey of (a) N-CS-900 and (b) Fe-N-CS-900.

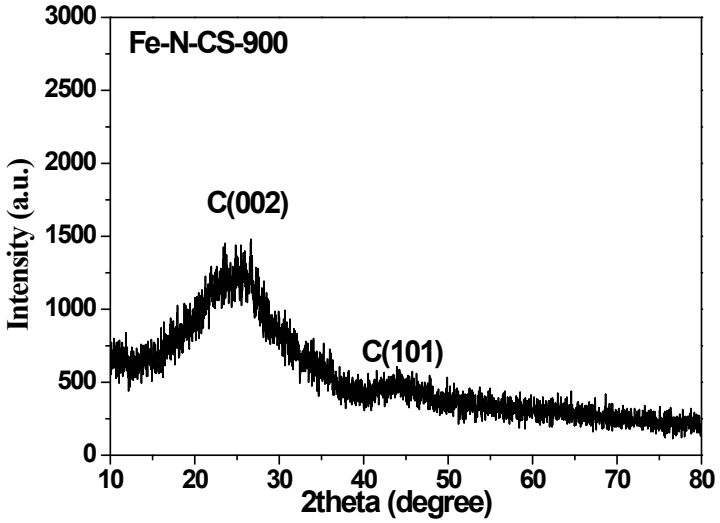

Figure S4 XRD pattern of Fe-N-CS-900 sample.

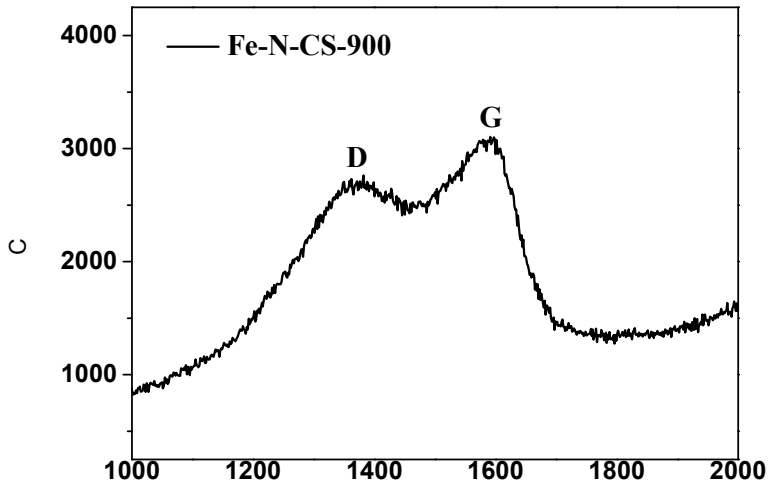

Figure S5 Raman spectrum of Fe-N-CS-900 sample.

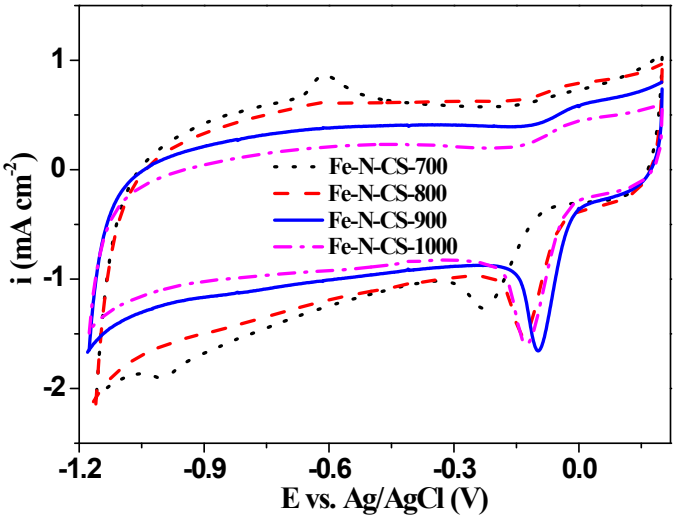

Figure S6 a, b, c) Cyclic voltammograms of Fe-N-CS-700, Fe-N-CS-800 and Fe-N-CS-900,Fe-N-CS-1000 samples on a glassy carbon rotating disk electrode in O_2-saturated 0.1 M KOH with scan rate of 20 mV s^{-1}.

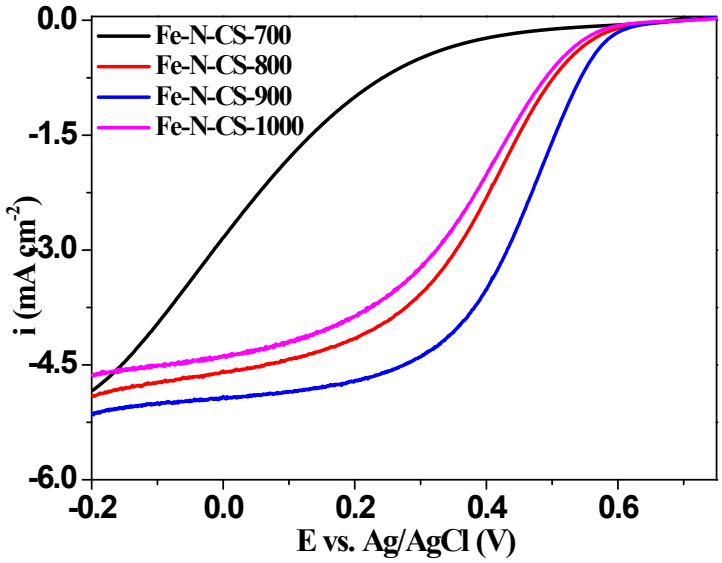

Figure S7 LSV curves of Fe-N-CS-700, Fe-N-CS-800, Fe-N-CS-900 and Fe-N-CS-1000 catalysts modified electrodes at rotation rate of 1600 rpm in O_2-saturated acidic media.

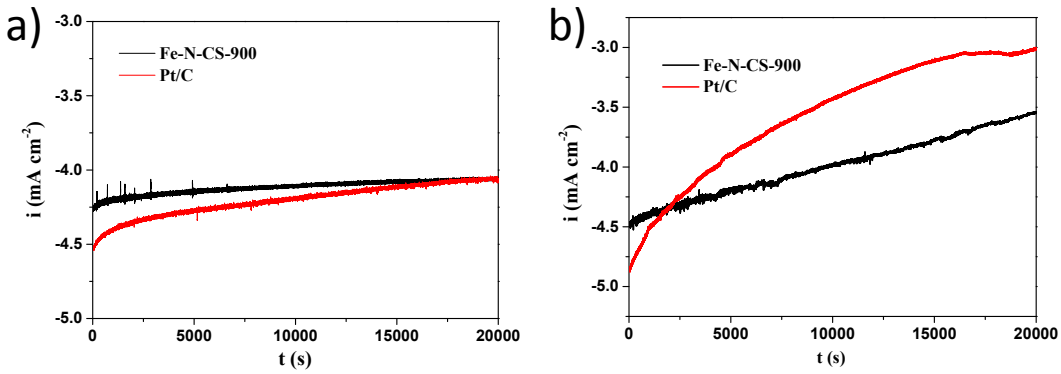

Figure S8 a) Chronoamperometric responses for the ORR on the Fe-N-CS-900 catalyst and commercial Pt/C catalyst modified electrodes in O_2-saturated alkaline media for 20000 s.

b) Chronoamperometric responses for the ORR on the Fe-N-CS-900 catalyst and commercial Pt/C catalyst modified electrodes in O_2-saturated acidic media for 20000 s.