

Fig.S1 Rietveld refined XRD of NSC_xC: (a) NSC; (b) NSC_{0.05}C; (c) NSC_{0.15}C;
(d) NSC_{0.2}C

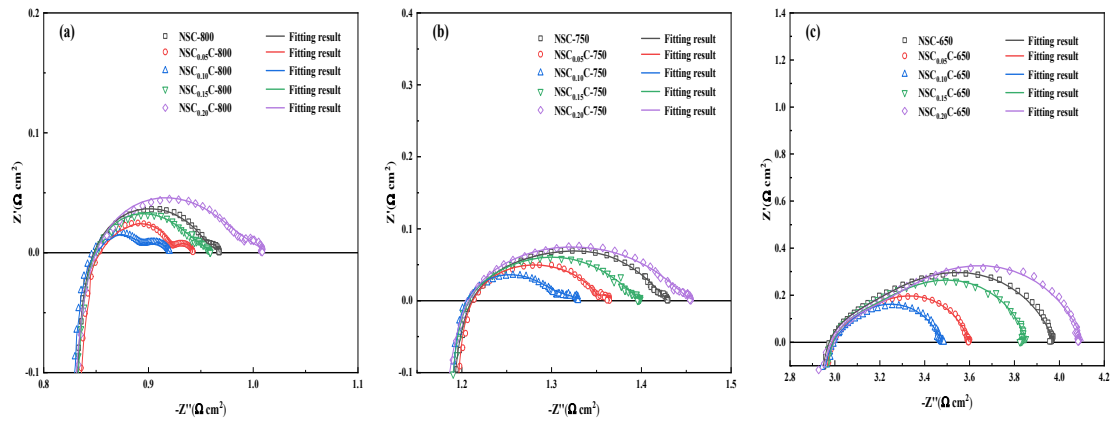


Fig.S2 Nyquist diagram of NSC_xC (a) 800 °C; (b) 750 °C; (c) 700 °C

Table S1 Thermal expansion coefficient of NSC_xC at different temperatures

Sample	CTE($\times 10^{-6}$ °C)				
	35~800 °C	35~200 °C	200~400 °C	400~600 °C	600~800 °C
NSC	24.2049	18.1394	25.9635	25.8948	25.7603
NSC _{0.05} C	22.5204	18.8576	22.4666	23.7632	24.3532
NSC _{0.1} C	21.7031	17.1650	21.6936	23.0238	24.1359
NSC _{0.15} C	21.2729	16.7099	20.4958	22.5887	24.0989
NSC _{0.2} C	19.7623	16.8623	17.8104	19.9381	23.9310

Table S2 The binding energy of O_{moisture} , O_{adsorbed} , O_{vacancy} , O_{lattice} and the ratio of $(O_{\text{adsorbed}}+O_{\text{vacancy}})/O_{\text{lattice}}$.

Sample	O_{moisture} (eV)	O_{adsorbed} (eV)	O_{vacancy} (eV)	O_{lattice} (eV)	$(O_{\text{adsorbed}}+O_{\text{vacancy}})/O_{\text{lattice}}$
NSC	532.85	531.19	529.25	528.63	3.14
NSC _{0.05} C	532.90	531.08	529.31	528.38	3.29
NSC _{0.1} C	532.72	531.20	529.34	528.54	3.35
NSC _{0.15} C	532.92	531.20	529.12	528.50	3.32
NSC _{0.2} C	532.94	531.25	529.38	528.58	3.30

Table S3 Power density of NSC and NSC_{0.1}C in range of 800-650 °C

Sample	800°C(mW.cm ⁻²)	750°C(mW.cm ⁻²)	700°C(mW.cm ⁻²)	650°C(mW.cm ⁻²)
NSC	391.03	296.30	263.25	187.85
NSC _{0.1} C	409.31	321.40	268.69	192.44