

Supplementary information

Role of iron incorporation in the structural and chemical stability of spinel cobalt oxide under the oxygen evolution reaction conditions in neutral media

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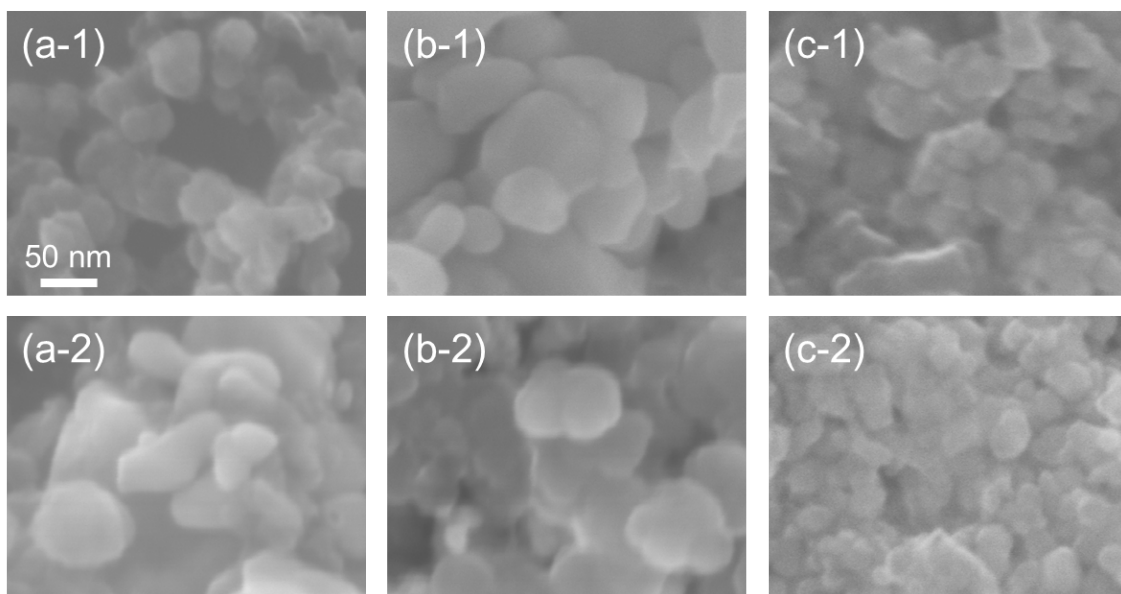


Figure S1: SEM images of (a) FCO-0, (b) FCO-1, and (c) FCO-2 nanoparticles (1) before and (2) after constant potential measurements at 1.9 V vs. RHE for 24 h in NaH_2PO_4 and Na_2SO_4 aqueous solution (pH 7).

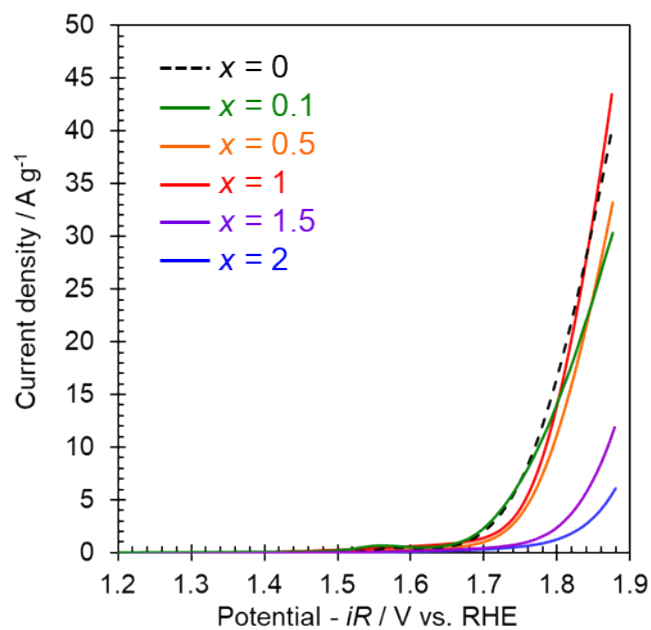


Figure S2: linear sweep voltammograms normalized loading amount of FCO- x ($0 \leq x \leq 2$) on the electrodes in NaH_2PO_4 and Na_2SO_4 aqueous solution (pH 7).

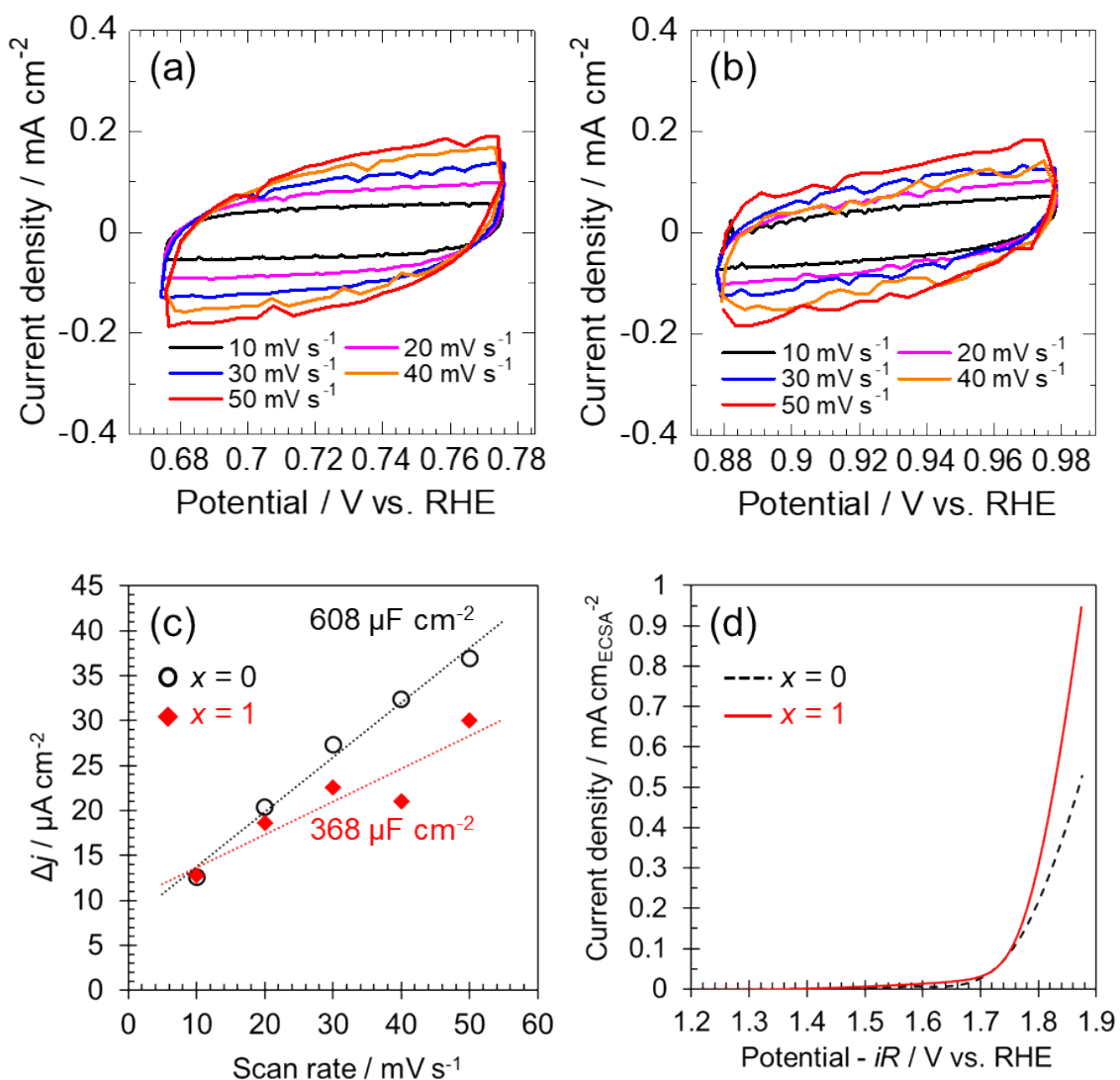


Figure S3: Cyclic voltammograms of (a) FCO-0 and (b) FCO-1 at the non-Faradaic regions, (c) differences between the anodic and cathodic current density ($\Delta j = j_a - j_c$) in (a) and (b) plotted against the scan rate, and (d) current density of FCO-0 and FCO-1 normalized by ECSA in NaH₂PO₄ and Na₂SO₄ aqueous solution (pH 7). The ECSA values were calculated by dividing the double layer capacitance values evaluated from (c) by the standard specific capacitance of 40 $\mu\text{F cm}^{-2}$ based on literature.^{S1}

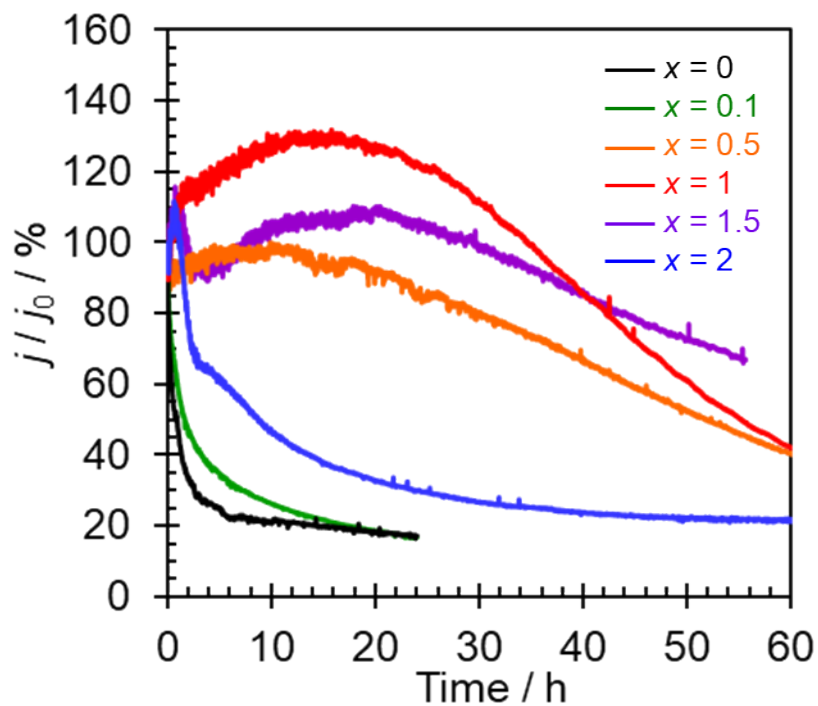


Figure S4: time courses of normalized current density at 1.9 V vs. RHE on FCO- x ($0 \leq x \leq 2$) in NaH_2PO_4 and Na_2SO_4 aqueous solution (pH 7). The values of current density were normalized by the respective initial values.

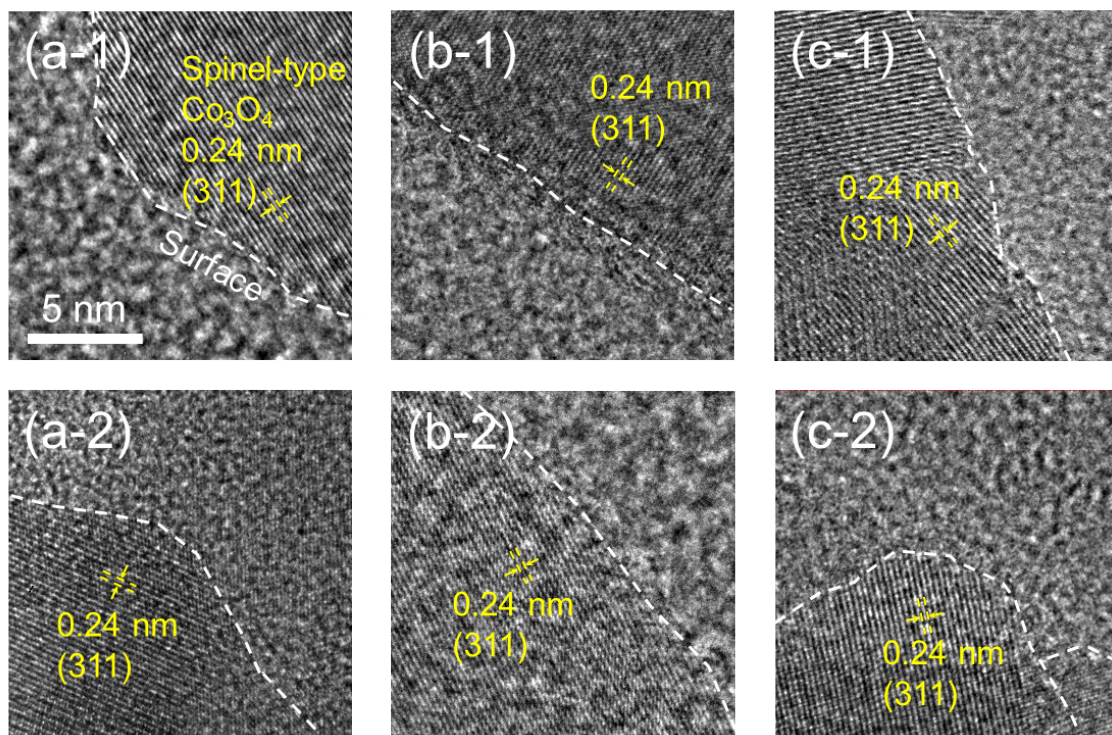


Figure S5: HRTEM images of (a) FCO-0.5, (b) FCO-1.5, and (c) FCO-2 electrodes (1) before and (2) after constant potential measurements at 1.9 V vs. RHE for 24 h in NaH_2PO_4 and Na_2SO_4 aqueous solution (pH 7).

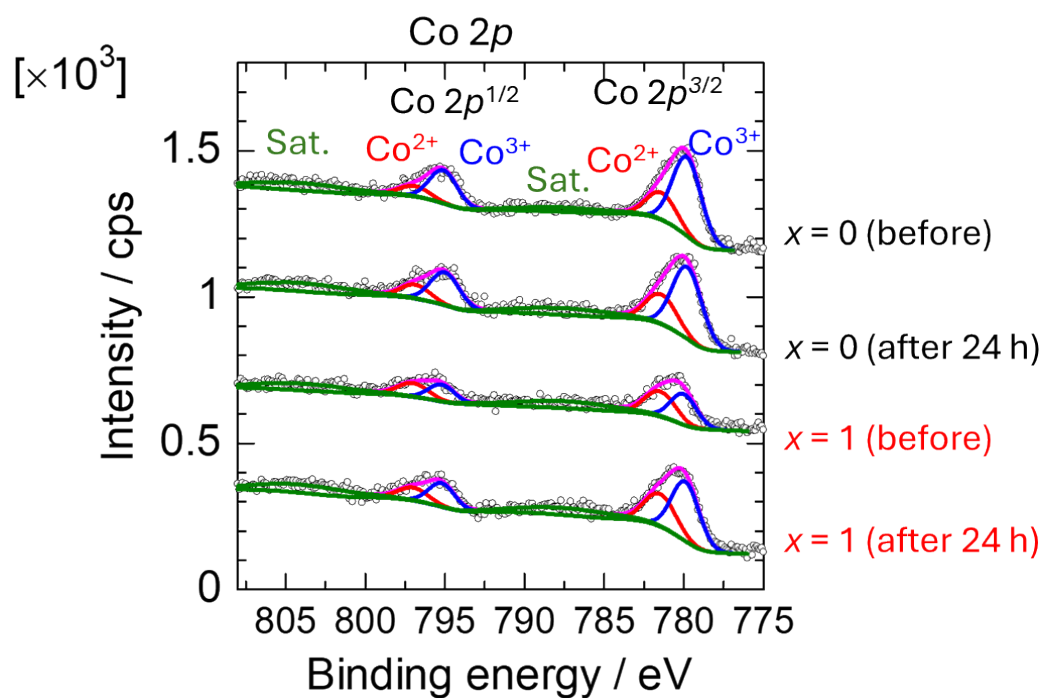


Figure S6: XPS spectra of Co2p of (a) FCO-0, and (b) FCO-1 (1) before and (2) after constant potential measurements at 1.9 V vs. RHE for 24 h in NaH₂PO₄ and Na₂SO₄ aqueous solution (pH 7).

Reference

[S1] K.-Li. Yan, X. Shang, Z.-Z. Liu, B. Dong, S.-S. Lu, J.-Q. Chi, W.-K. Gao, Y.-M. Chai and C.-G. Liu, *Int. J. Hydrogen Energy*, **2017**, *42*, 24150-24158.