

Supporting information

Electrochemically induced surface modifications of mesoporous spinels ($\text{Co}_3\text{O}_{4-\delta}$, $\text{MnCo}_2\text{O}_{4-\delta}$, $\text{NiCo}_2\text{O}_{4-\delta}$) as the origin of the OER activity and stability in alkaline medium

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Synthesis of mesoporous NiO

0.50 g of SBA-15 were dispersed in 5 mL of ethanol containing nickel nitrate $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ (99%, Merck) at a concentration of 0.7 mol L^{-1} . The solution was then stirred for 1 h at room temperature before evaporation of ethanol at $50 \text{ }^\circ\text{C}$. The composite was calcined at $300 \text{ }^\circ\text{C}$ for 6 h in order to decompose nitrate species. A second impregnation was carried under the same experimental conditions. The impregnation step was followed by calcination at $450 \text{ }^\circ\text{C}$ for 6 h under air. The silica template was then removed using 2 mol L^{-1} NaOH aqueous solution. Mesoporous NiO powder was then filtered and washed several times with ultra-pure water. The powder was finally dried at $50 \text{ }^\circ\text{C}$ during 24 h.

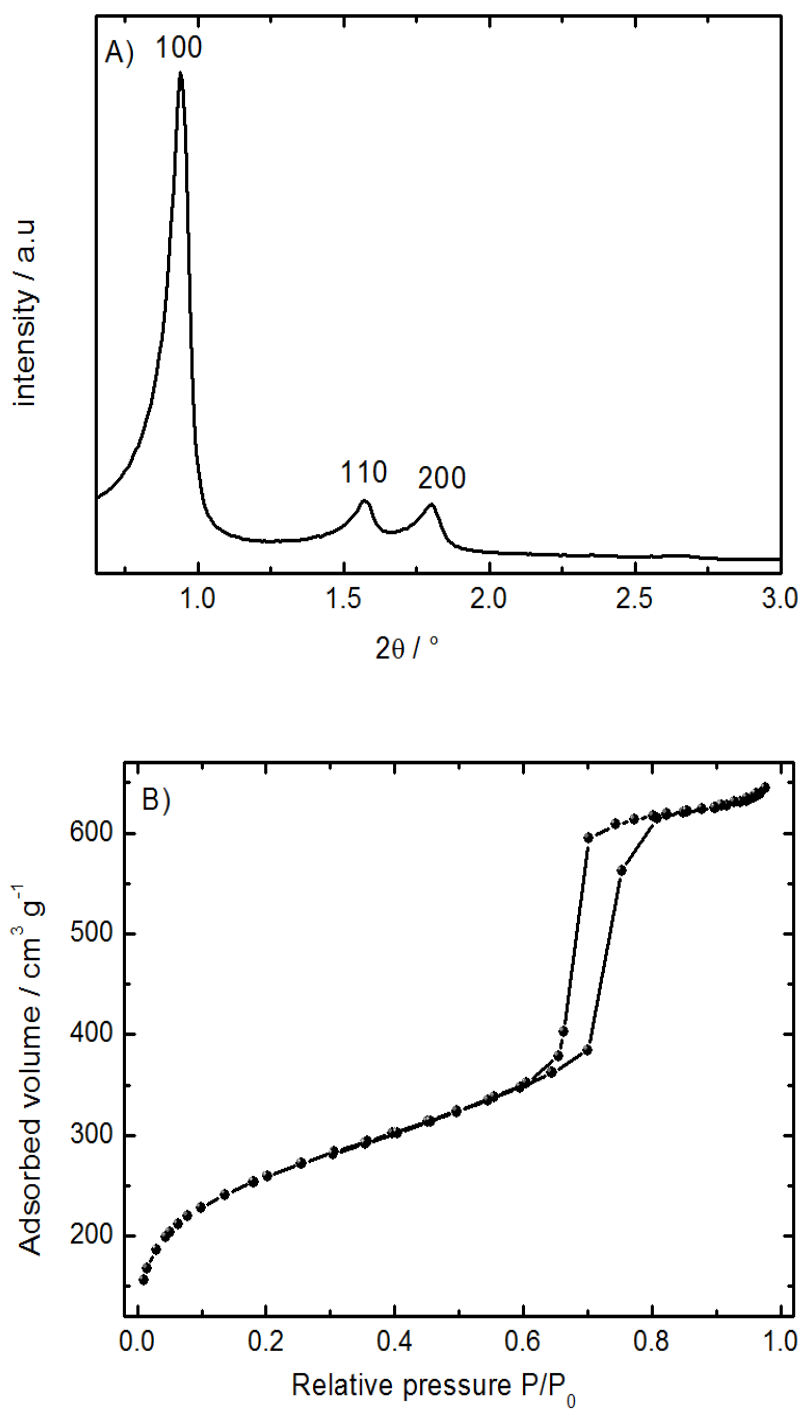


Figure S1. (A) Low angle XRD pattern of SBA-15 template; (B) N₂ adsorption-desorption isotherm for SAB-15 template.

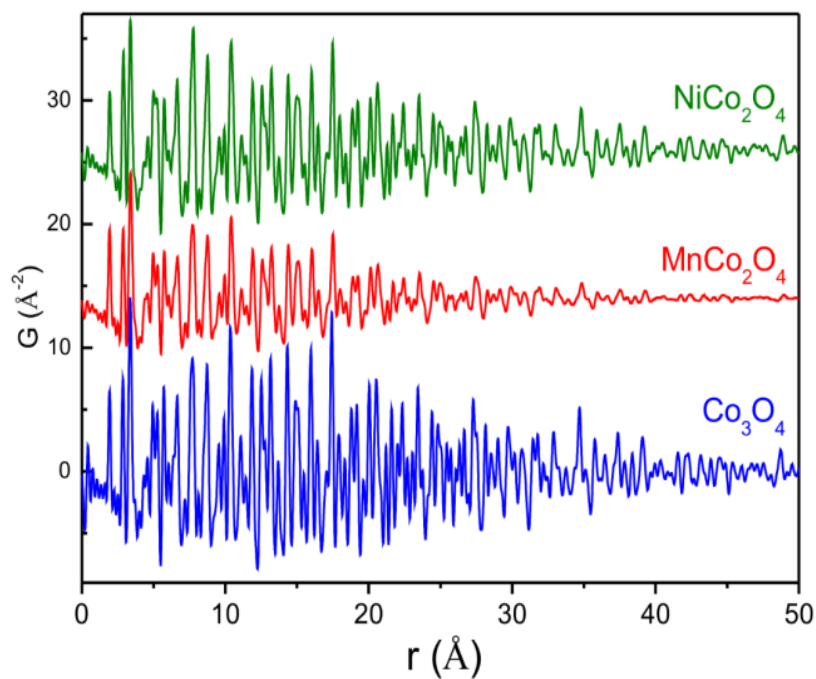


Figure S2. PDFs of $\text{Co}_3\text{O}_{4-\delta}$, $\text{MnCo}_2\text{O}_{4-\delta}$, $\text{NiCo}_2\text{O}_{4-\delta}$. In the case of $\text{MnCo}_2\text{O}_{4-\delta}$, the features in the PDF tend to fall off at around 40 Å which primary indicates a lower particle size as compared to $\text{Co}_3\text{O}_{4-\delta}$ and $\text{NiCo}_2\text{O}_{4-\delta}$.

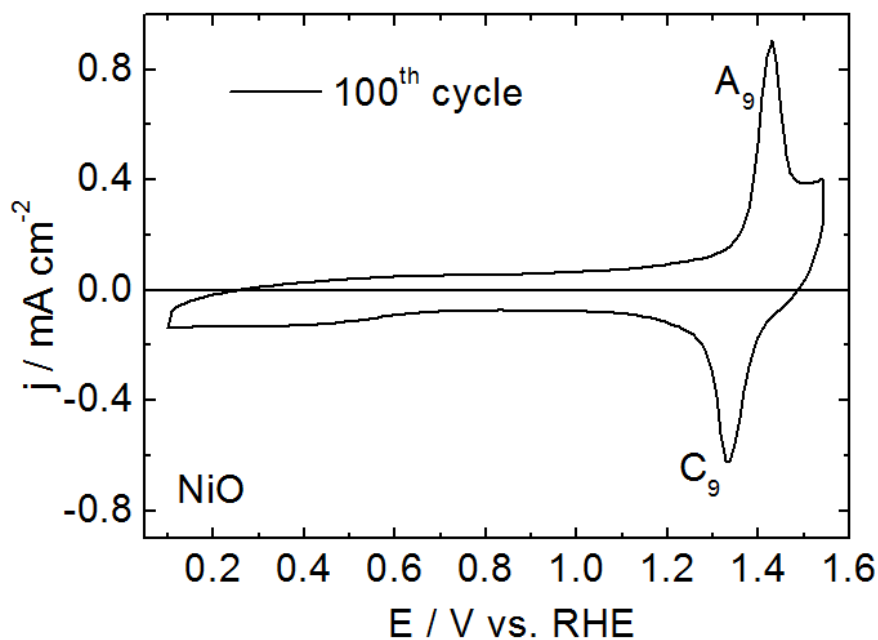


Figure S3. Voltammogram recorded in supporting electrolyte (0.1 M KOH) under N_2 atmosphere at a scan rate of 50 mV s^{-1} with NiO at room temperature

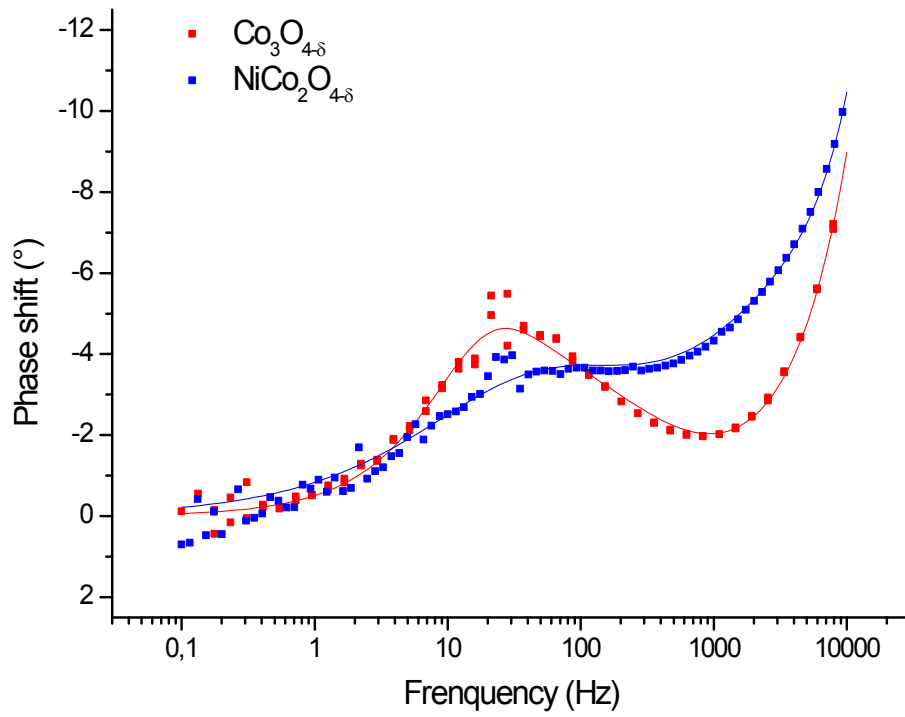


Figure S4. Overlay of EIS bode plots for $\text{Co}_3\text{O}_{4-\delta}$ (red) and $\text{NiCo}_2\text{O}_{4-\delta}$ (blue) at 1.800 V vs. RHE. Solid lines are fitting results.