Supporting Information

Pluronic-123-Assisted Synthesis of Cobalt Vanadate Microparticles (μ-CoV MPs) for Durable Electrochemical Oxygen Evolution Reaction in Seawater and Connate Water

Ibrahim Khan †

School of Chemical Engineering and Materials Science, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul 06974, Republic of Korea; ebraheem.chemist@gmail.com or ebraheemchem@cau.ac.kr
† Ibrahim Khan (BrainPool Researcher).

Post OER XRD spectral comparison

The phase structure and crystallinity characterization of the post-OER metal vanadates electrodes calcined at 400 ºC (μ-CoV-400) were scanned from 10° to 80° (2θ) at a scan rate of 0.05 degrees/min) and compare with as-fabricated fresh μ-CoV-400 electrodes **(Figure S1)**. The high-intensity characteristic XRD diffraction patterns (022), (220), (331), (400), (004, (511), and (440) correspondingly centred at the 2θ = 27.5º, 29.3 º, 34.6 º, 42.8 º, 53.4 º, 58.7 º and 63.1 º were reduced in the OER measured electrodes [43,57–59]. The reduction in peak intensity suggests intense physicochemical changes at the electrode surface during the OER in SW after the electrochemical stability test.

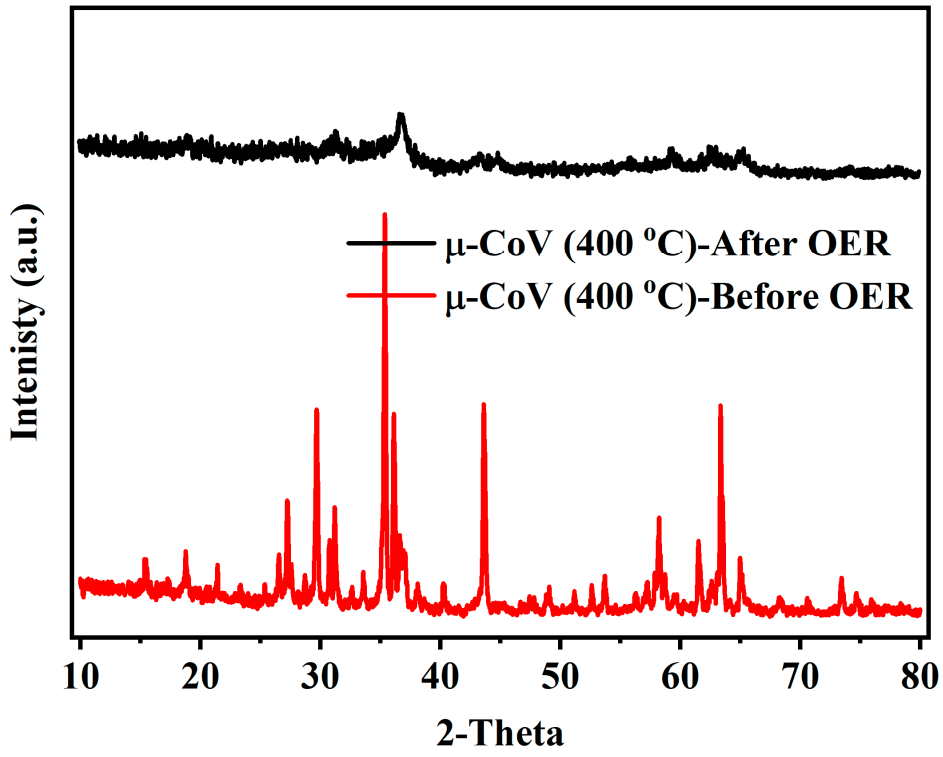

Figure S1: XRD patterns of μ-CoV MPs-400 °C before OER and after OER in SW.

Electrokinetic comparison in terms of Tafel plots

As shown in **Figure S2**, The high Tafel slope value of 199 mV dec^{-1} was obtained from μ-CoV MPs@400 °C in CW electrolyte after 1 h OER. In response, the rate of reaction is slightly reduced from 199 mV dec^{-1} to 206 mV dec^{-1}, in SW, which is possibly due to the strong alkalinity and concentration of CW water that offered slightly more resistance in the OER process.

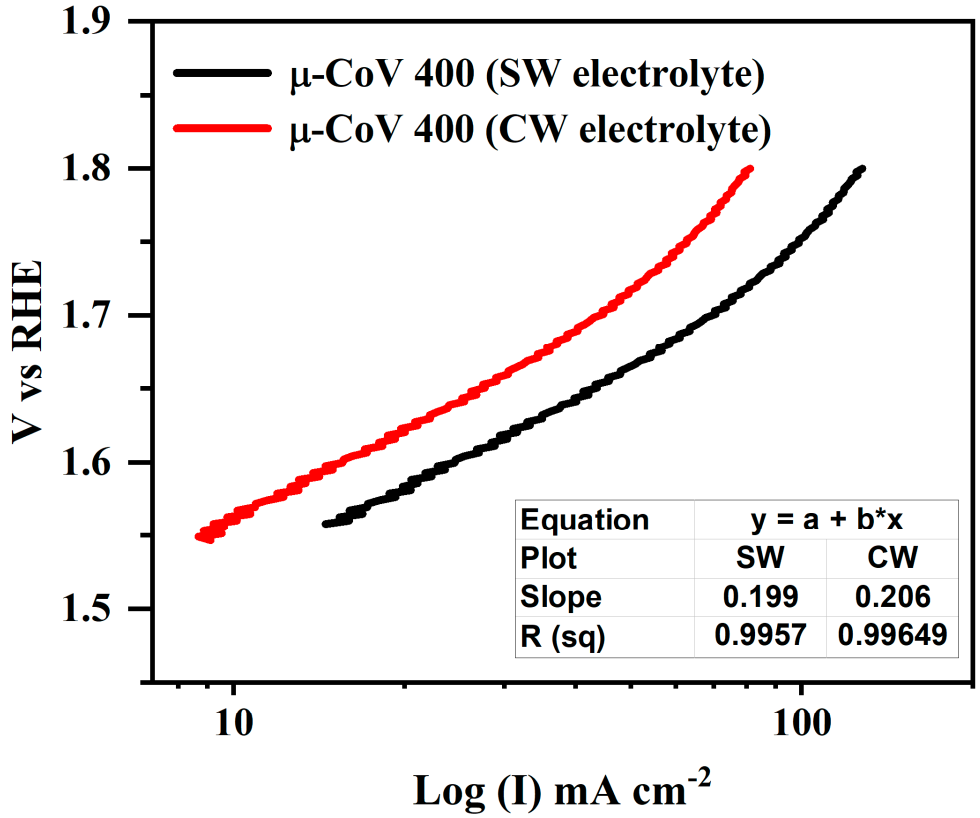

Figure S2: Tafel plots under different electrolytic conditions.