

Supporting Information

Measurement methods on electrodes and electrocatalysts for water electrolysis

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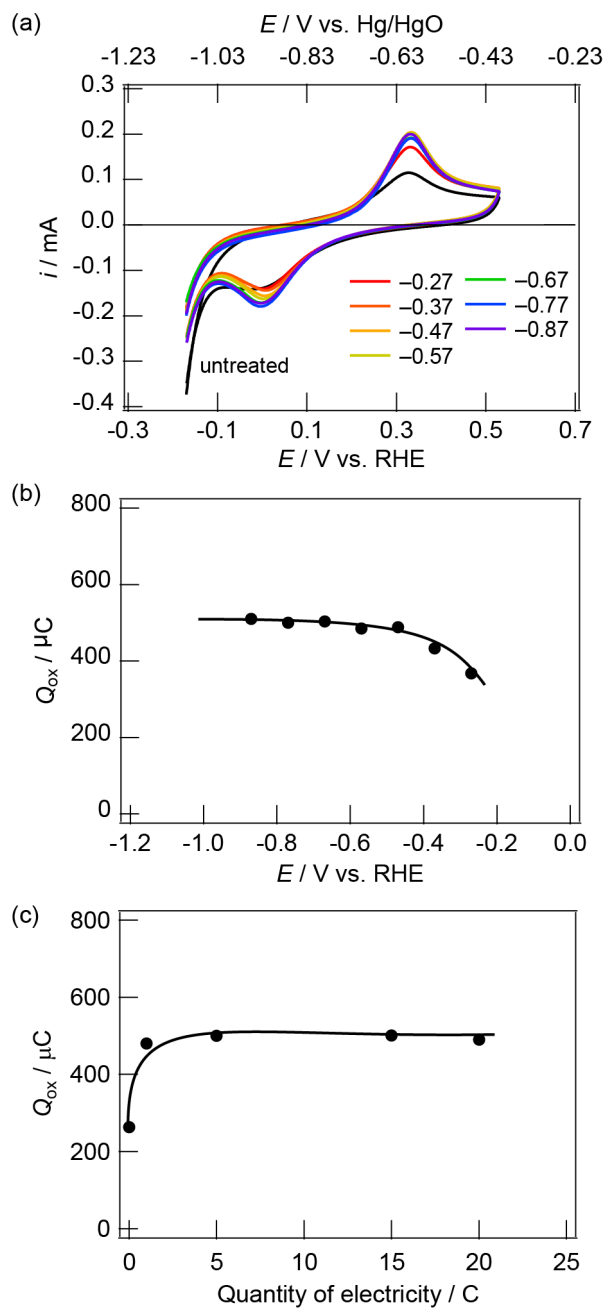


Figure S1. (a) Cyclic voltammograms of a smooth Ni electrode when E_{red} is varied from -0.27 to -0.87 V vs. RHE. Scan rate: 50 mV s^{-1} . (b) Change in Q_{ox} with E_{red} , (c) variation of Q_{ox} with reduced electrical quantity at -0.47 V vs. RHE. The potential measured to Hg/HgO was converted to those measured to RHE.

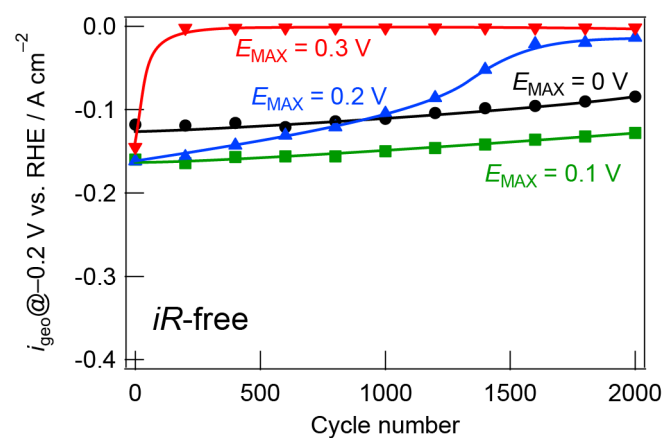


Figure S2. Change in i_{geo} value at -0.2 V vs. RHE during the start/stop cycles at E_{MAX} from 0 to 0.3 V vs. RHE.

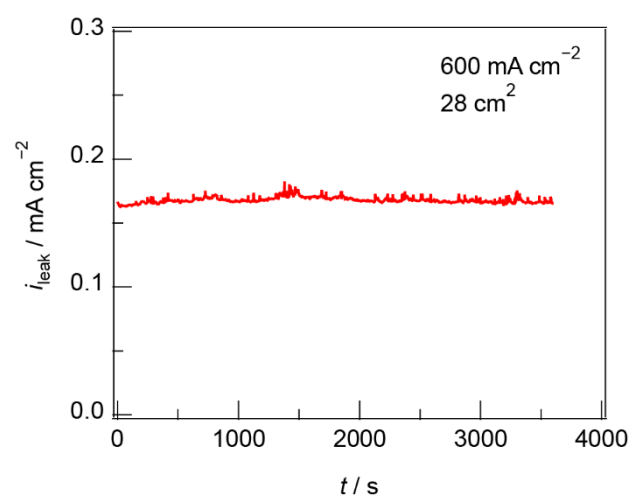


Figure S3. Leakage current during electrolysis.

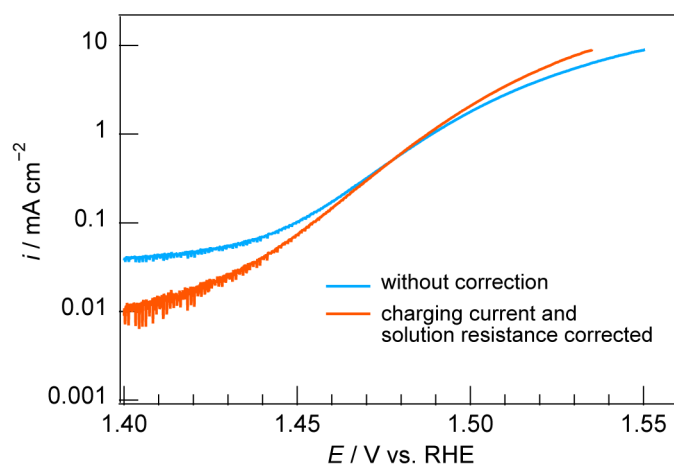


Figure S4. Example of LSV curve with charging current correction (0.03 mA cm^{-2} @ 1.3 V vs. RHE) and solution resistance correction (solution resistance: 6Ω).

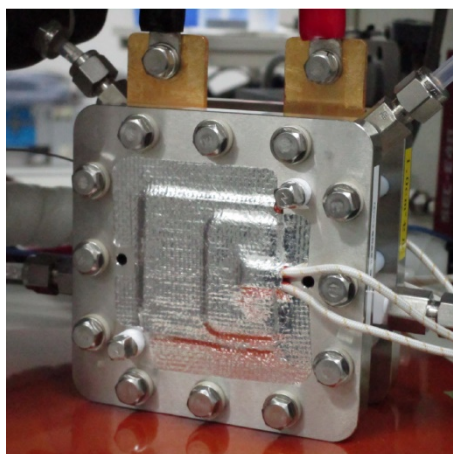


Figure S5. Example electrolytic cell used for laboratory evaluation.

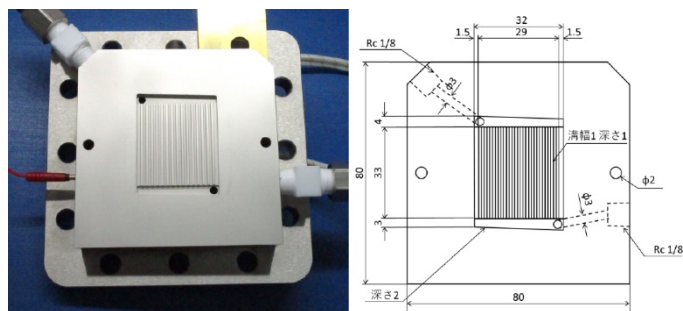


Figure S6. Example of electrolytic cell (10 cm^2) used for laboratory evaluation.

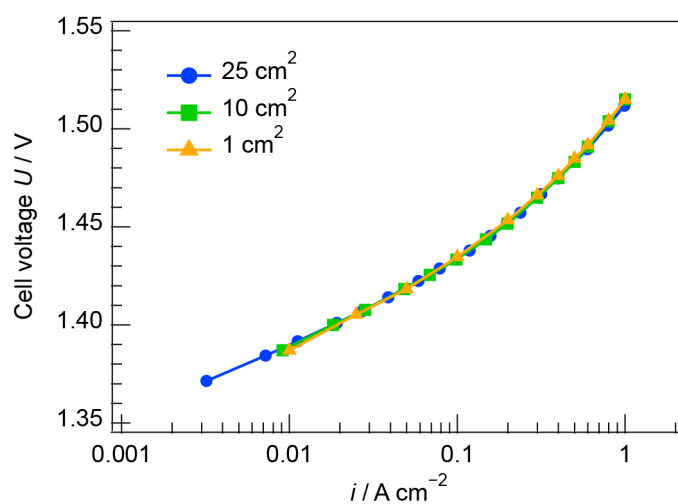


Figure S7. I–V characterization of PEMWE cells with electrode areas of 1, 10, and 25 cm^2 .

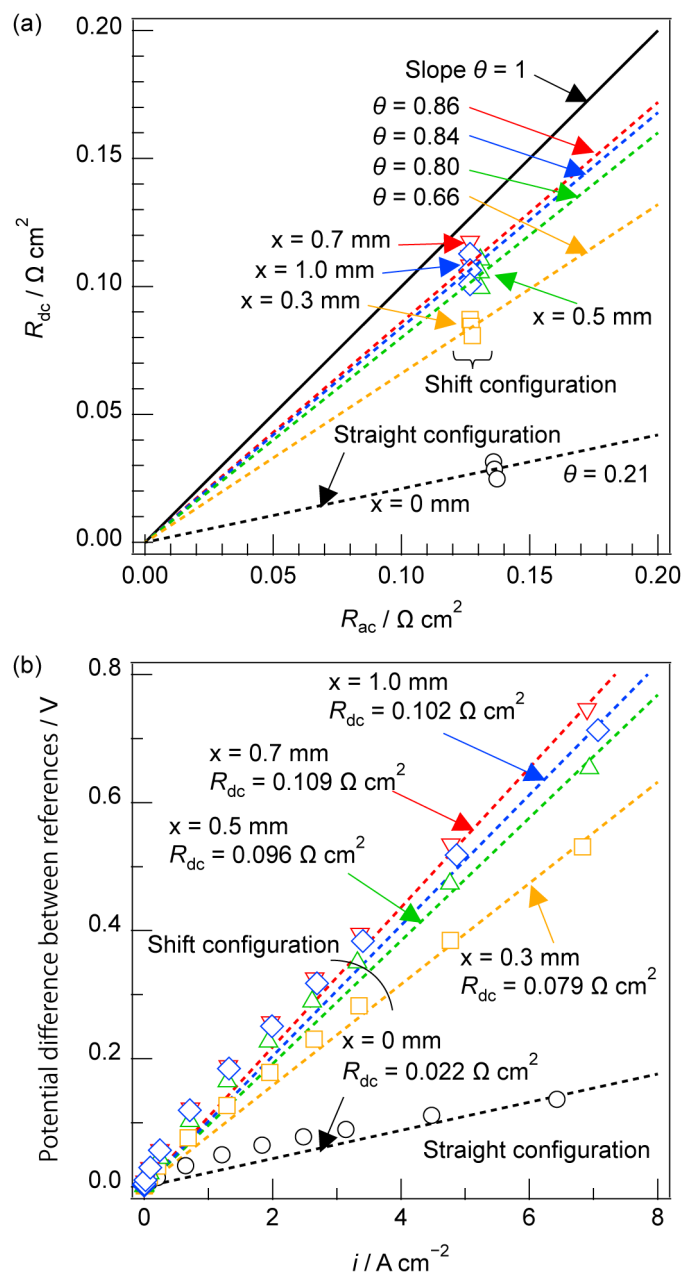


Figure S8. Dependence of (a) DC resistance and internal resistance between reference electrodes and (b) potential difference and current density between reference electrodes on electrode shift.

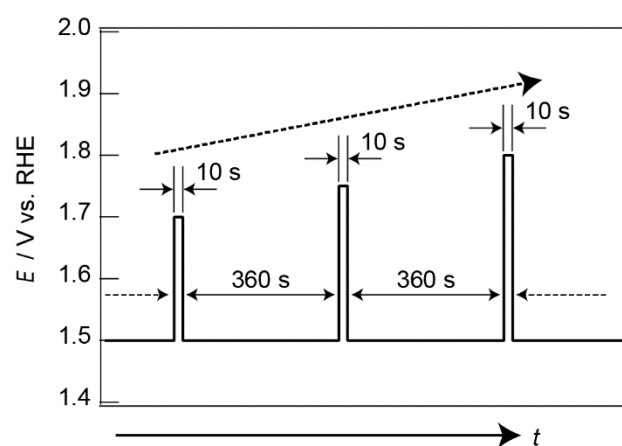


Figure S9. Electrochemical sequence for measurements using forced flow cell.

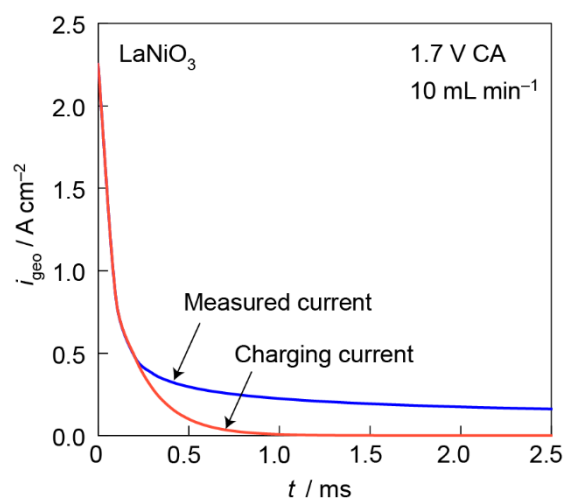


Figure S10. Current behavior at the beginning of the potential step.

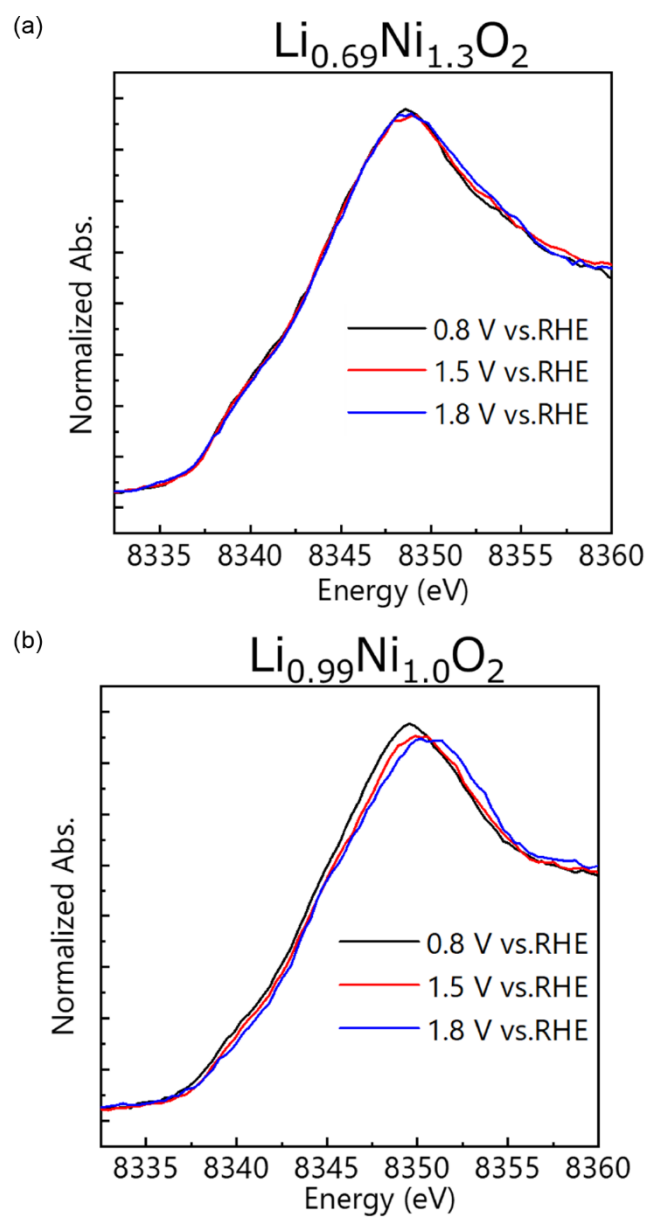


Figure S11. Operando XAFS measurements (Ni K-edge) of (a) $\text{Li}_{0.69}\text{NiO}_{1.32}$, and (b) $\text{Li}_{0.99}\text{NiO}_{1.02}$.

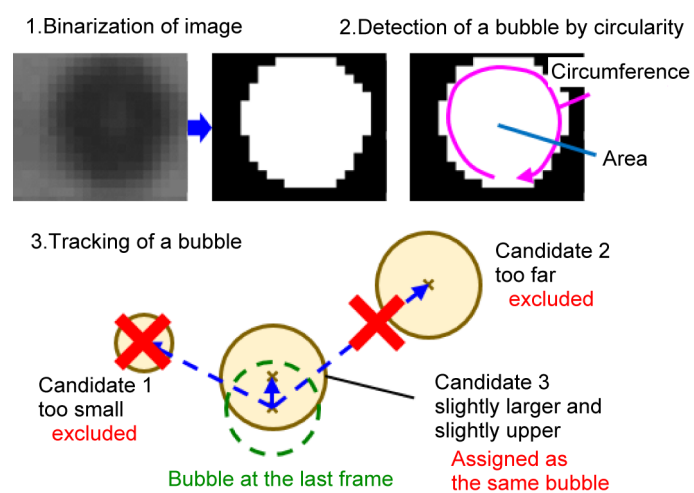


Figure S12. Schematic illustrating image analysis.