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Supplementary Information

High-performance anion exchange membrane alkaline seawater electrolysis

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KEYWORDS : anion exchange membrane water electrolysis; alkaline seawater electrolysis; hydrogen energy; seawater electrolysis;

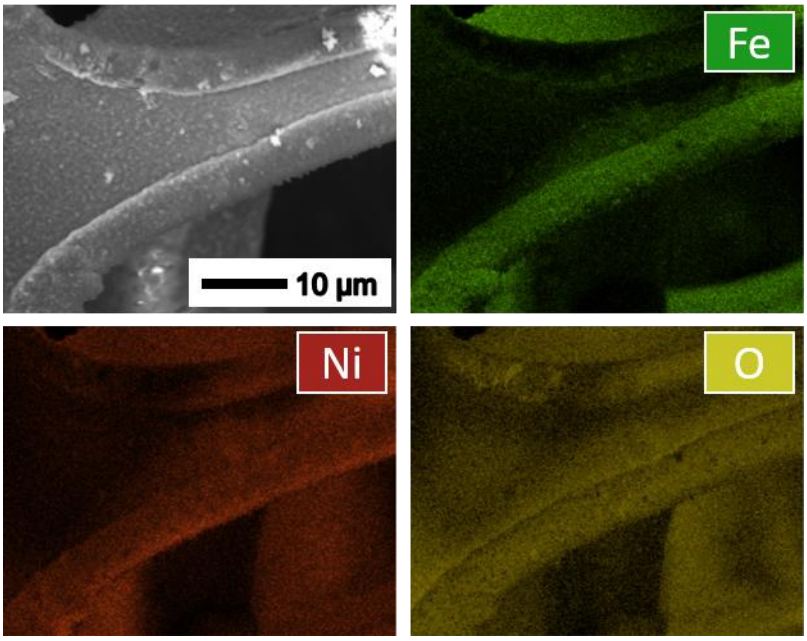

Figure S1. EDS elemental maps of Ni-doped FeOOH.

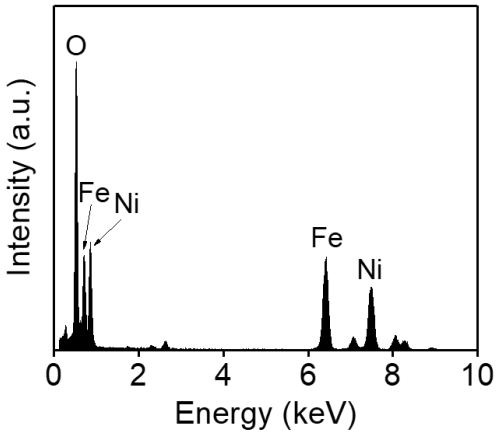

Figure S2. EDS spectra of Ni-doped FeOOH.

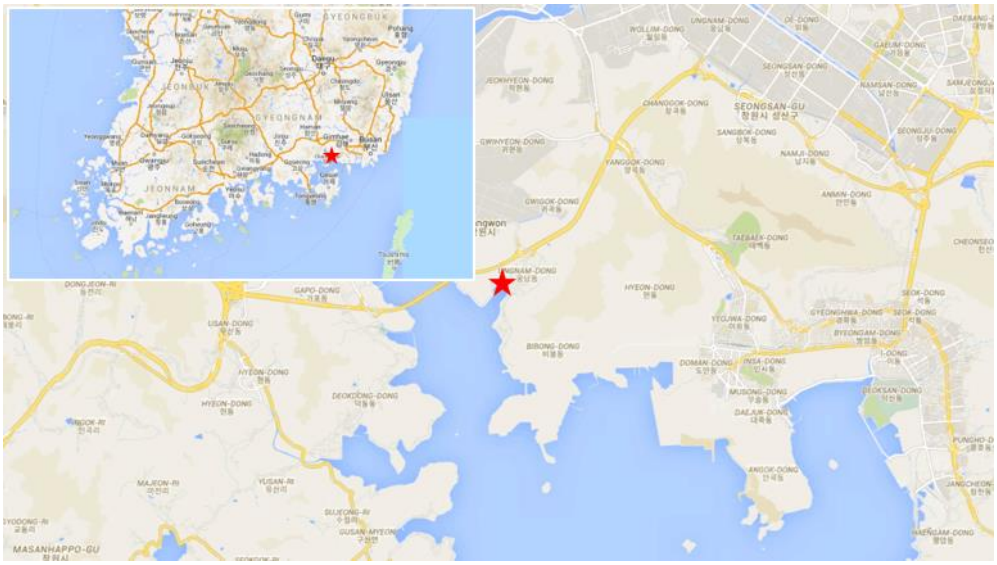

Figure S3. Location of seawater sampling. The seawater was obtained from Changwon city in Republic of Korea.

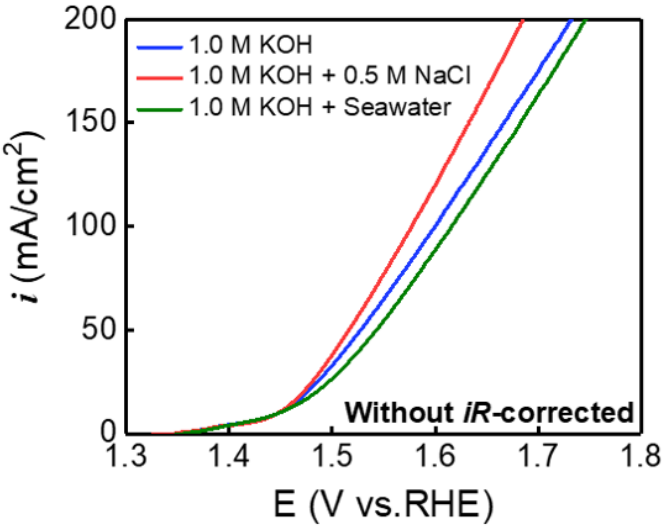

Figure S4. *iR*-uncorrected polarization curves of the Ni-doped FeOOH with different electrolytes: 1 M KOH (blue), 1 M KOH + 0.5 M NaCl (red), and 1 M KOH + seawater (green).

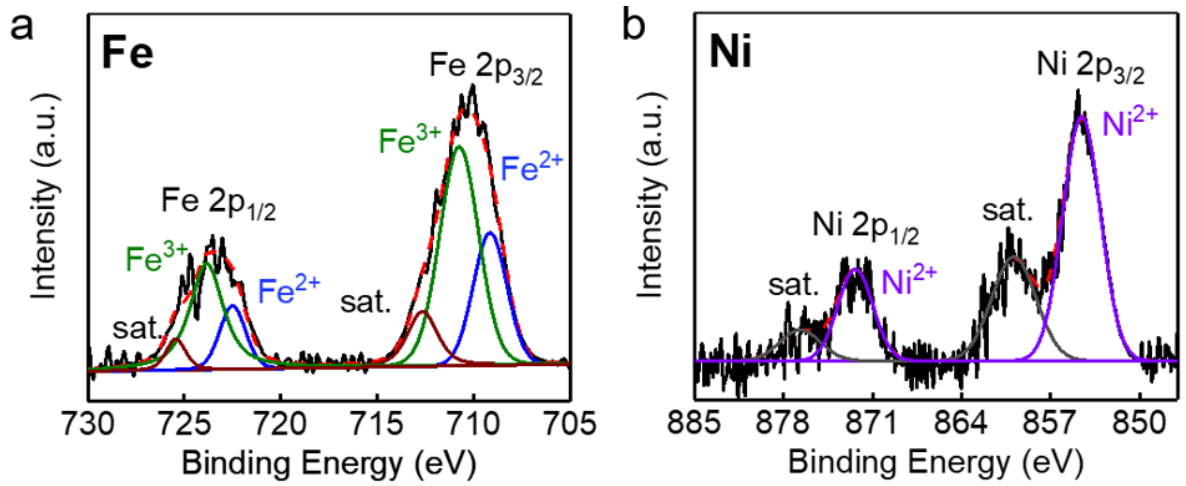

Figure S5. XPS analysis of Ni-doped FeOOH after the stability test in 1M KOH + seawater: (a) Fe 2p and (b) Ni 2p.

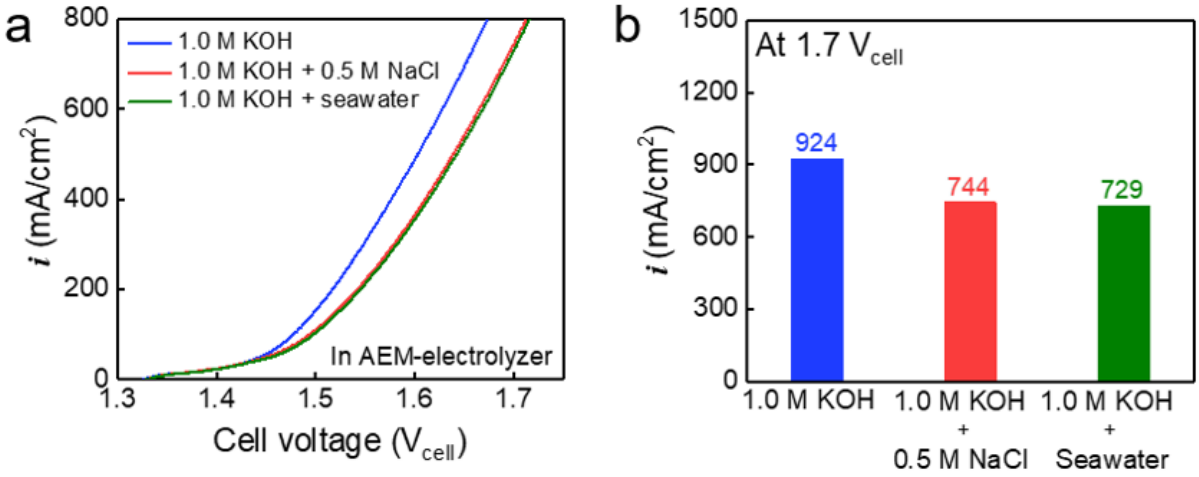

Figure S6. (a) Performance of AEM electrolyzer catalyzed by Ni-doped FeOOH in different electrolytes. (b) Comparison of performance at 1.7 V_{cell}.

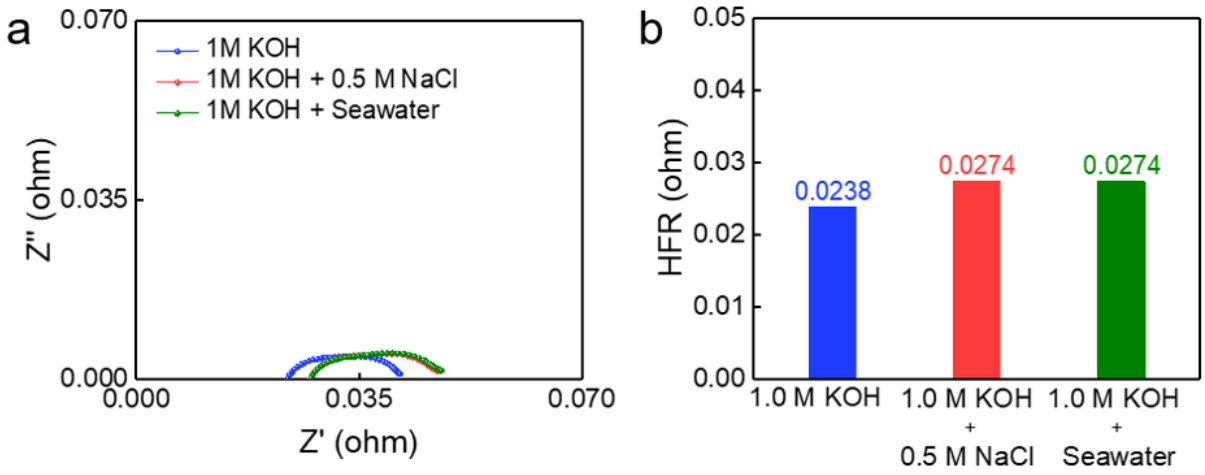

Figure S7. (a) Nyquist plots of AEM electrolyzer catalyzed by Ni-doped FeOOH in different electrolyte. (b) High-frequency resistance of AEM electrolyzer.

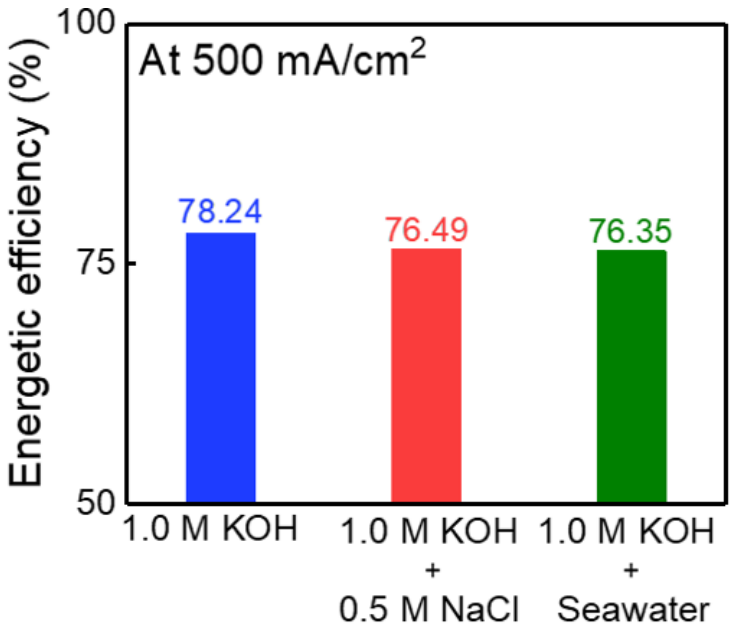

Figure S8. Cell efficiency of AEM electrolyzer catalyzed by Ni-doped FeOOH in different electrolytes at 500 mA/cm^2.

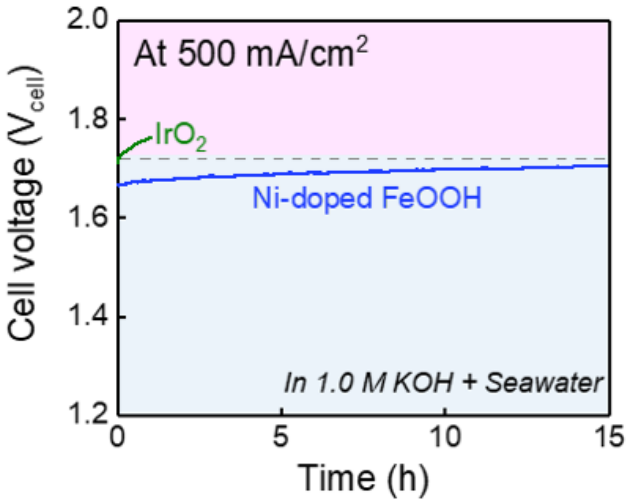

Figure S9. Durability of AEM electrolyzers catalysed Ni-doped FeOOH and IrO_2 at 500 mA/cm^2. The light blue region represents 1.72 V_{cell} or less, and the pink region represents 1.72 V_{cell} or more.

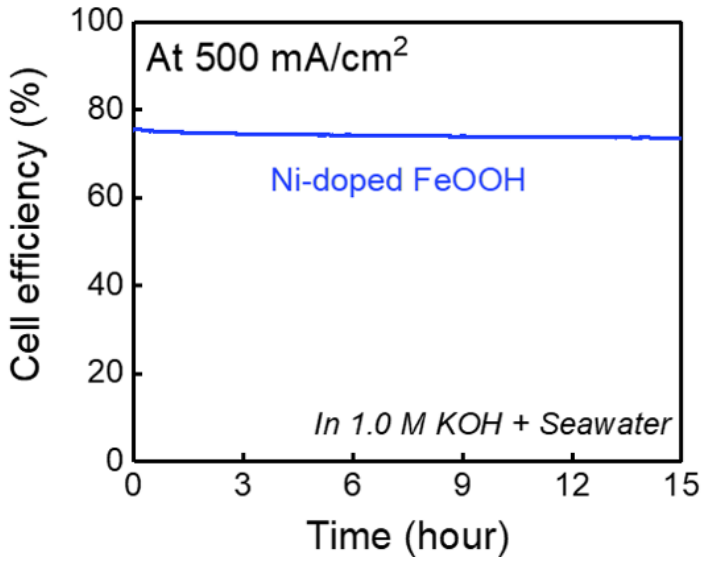

Figure S10. Cell efficiency of AEM electrolyzer catalyzed by Ni-doped FeOOH in alkaline seawater at 500 mA/cm^2 during 15 h.