Supporting Information

Investigation of the stability of NiFe-(Oxy)hydroxide anodes in alkaline water electrolysis under industrially relevant conditions

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Figure S1. EDX analysis of as-deposited NiFeO$_x$H$_y$ sample.
Figure S2. XRD patterns of fresh supported NiFeO$_x$H$_y$ sample and bare Au-coated Si substrate.

Figure S3. Chronopotentiograms of NiFeO$_x$H$_y$ conducted at $j = 100$ mA cm$^{-2}$ at different temperatures and KOH concentrations.
Figure S4. XPS analysis of fresh NiFeO$_x$H$_y$ and after 1 hour of immersion in 10 M KOH at 75 °C without anodic polarization.
Figure S5. Ni 2p spectra of NiFeO$_x$H$_y$ samples after the stability tests performed under different conditions.
Figure S6. Fe 2p spectra of NiFeO$_x$H$_y$ samples after the stability tests performed under different conditions. For the sample tested at 75 °C in 10 M KOH, no peak fitting was performed, because of the strong intensity of the Ni Auger LMM feature overlapping with the weak Fe 2p$_{3/2}$ peak for this low Fe-containing sample.
Figure S7. O 1s spectra of NiFeO$_x$H$_y$ samples after the stability tests performed under different conditions.
Figure S8. Low-binding energy region of XPS survey scan of NiFeO$_x$H$_y$ before and after anodic polarization at 75 °C in 10 M KOH, $j = 100$ mA cm$^{-2}$. 
Figure S9. SEM image of the bare substrate, prior to film deposition. Scale bar is equal to 500 nm.

Figure S10. Chronopotentiograms of NiO$_x$H$_y$ (red) and NiFeO$_x$H$_y$ (black) conducted at $j = 100$ mA cm$^{-2}$, 75 °C, 5 M KOH.
Figure S11. iR-corrected Tafel plots of NiO\(_x\)H\(_y\) and NiFeO\(_x\)H\(_y\) before and after anodic polarization at 75 °C in 5 M KOH, \(j = 100\) mA cm\(^{-2}\). Measurements were carried out in 1 M KOH at 25 °C; the dots represent the experimental data, the lines represent the fittings.
Figure S12. SEM images of NiO$_x$H$_y$ a) before and b) after anodic polarization at 75 °C in 5 M KOH, $j = 100$ mA cm$^{-2}$, 1 h. Scale bars are equal to 500 nm.