Electronic Supplementary Information for: Gibeon meteorite yields a high-performance water oxidation electrocatalyst

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Figure S1. Three photographs of the Gibeon meteorite piece investigated. Including the native oxidized surface.

	Со	Fe	Ga	Ge	Ir	Ni	Р
Composition (%)	0.437	93.84	0.05	/	/	5.46	0.212
Composition (%, from [ref 32])	0.4 – 0.5	91.8	1–2 ppm	0.111ppm	2.4ppm	7.8 – 8	0.04

Table S1. Elemental composition of a piece of Gibeon meteorite used in this study, measured by ICP-OES, compared to the composition given by Buchwald in ref. 18, main text.



Figure S2. XRD scan of the Gibeon meteorite before oxidative operation. Blue lines correspond to the relative peak intensity of the iron(0) BCC crystal structure (ICDD: 04-006-6419).



Figure S3. a) Long term-stability of a Gibeon-based electrode is shown by plotting the iR corrected overpotential for 10 mA cm⁻² as a function of the operation time at 500 mA cm⁻². b) Sample reproducibility is shown by the average iR corrected overpotential measured at 10 mA cm⁻² (red, left axis) and the average Tafel slope (blue, right axis) with ageing time. Squares and fading area indicate the average value and standard deviation (around smoothed average values) respectively obtained from 5 multiple samples measurements.



Figure S4. Oxidation (anodic, red) and reduction (cathodic, blue) peak potentials of the $Ni^{2+}/^{3+}$ redox couple are shown against the iR-corrected overpotential required to drive 10 mA cm⁻². Broken lines indicate linear fits to the data.



Figure S5. XPS surveys obtained between 0 and 1400 eV for a Gibeon electrode before (a) and after 50 hours (b) of operation at 500 mA cm⁻². Spectra were acquired after a 2 min cleaning with Ar ions.



Figure S6. XPS spectra of a Gibeon sample before operation as an electrocatalyst in 1 M NaOH, centered around Co $2p_{3/2}$ peak (a also corresponding to the range of the Fe LMM at 784 eV), Fe $3p_{3/2}$ peak (b) an Ni $3p_{3/2}$ peak. (c) Spectra were measured after different Ar⁺ ion etching time (see legends on plots), corresponding to different thicknesses inside the electrode with an etching rate of 8.8 nm min⁻¹.



Figure S7. XPS spectra of a Gibeon sample after 50 hours operation as electrocatalyst in 1M NaOH, centered around Co $2p_{3/2}$ peak (a also corresponding to the range of the Fe LMM at 784 eV), Fe $3p_{3/2}$ peak (b) an Ni $3p_{3/2}$ peak. (c) Spectra were measured after different Ar⁺ ion etching time (see legends on plots), corresponding to different thicknesses inside the electrode with an etching rate of 8.8 nm min⁻¹.