Supplementary Materials

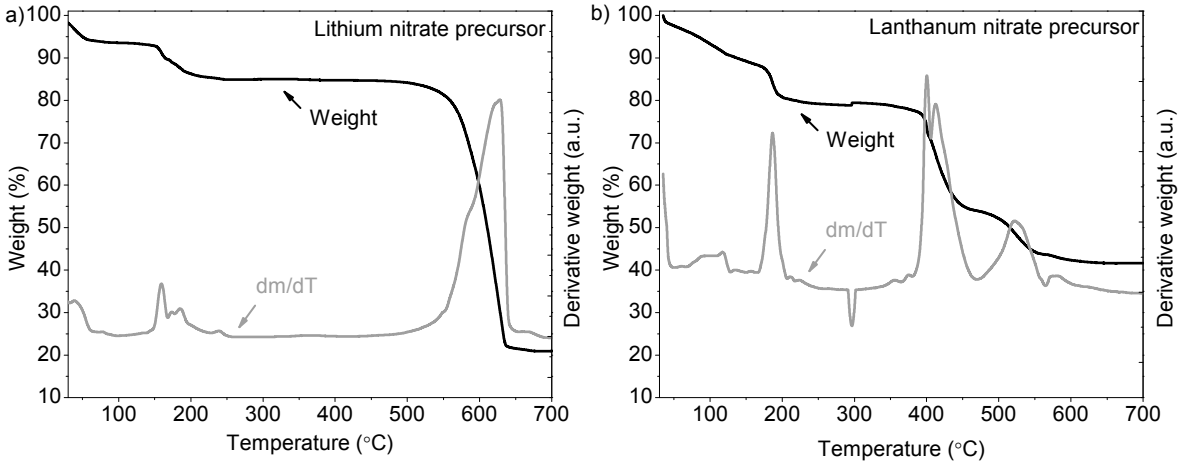

Figure S1. TGA analysis of (**a**) the lithium nitrate precursor and (**b**) lanthanum nitrate precursor dried at 60 °C, recorded at 10 °C·min^{-1} in dry air (0.1 ml·min^{-1}).

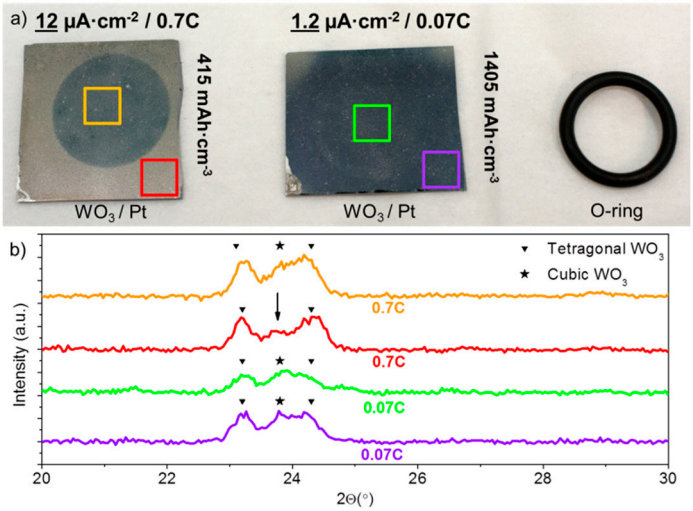

Figure S2. Comparison between WO_3 coated (10 cycles, 25 mM) Pt samples after a single lithiation down to 2.0 V vs Li^+/Li, at high and low current density. (**a**) Photograph of the samples and O-ring used in the electrochemical cell, showing dark blue coloration of lithiated areas. The colored squares relate to (**b**), showing XRD on isolated parts after cutting the samples.

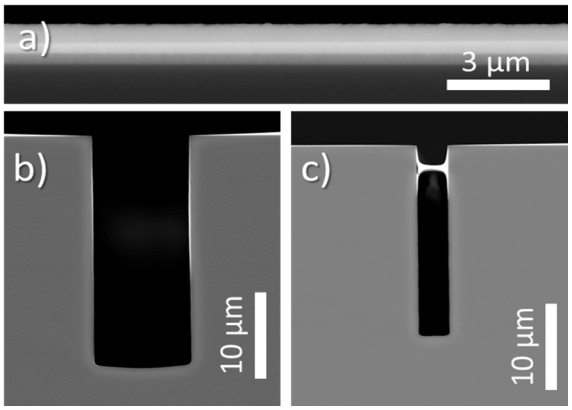

Figure S3. SEM micrograph showing backscattered (BSE) image of 10 cycles of W-precursor deposition on a (**a**) planar Si substrate, (**b**) trench of 10 by 27 µm and (**c**) trench of 3.5 by 22.5 µm, all annealed at 500 °C for 10 min in static air.

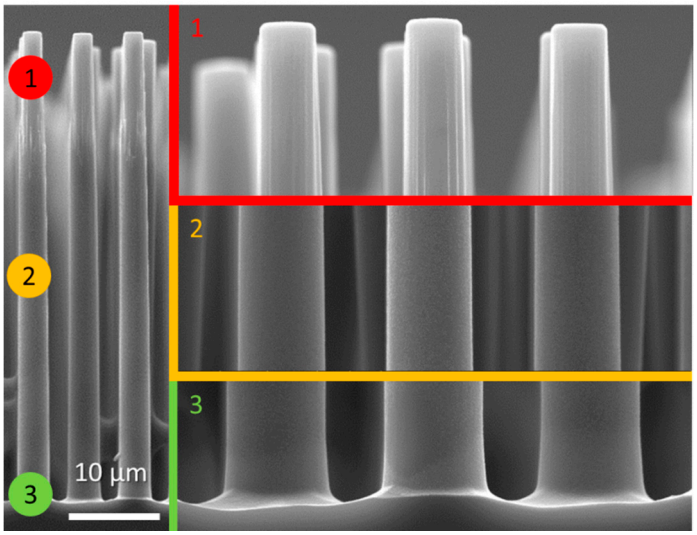

Figure S4. SEM micrograph of 10 cycles of W-precursor deposition at 180 °C on 50 µm high micro-cylinders, with an average diameter of 2.5 µm, with 5 µm inter-cylinder spacing. The sample was annealed at 500 °C for 10 min in static air.

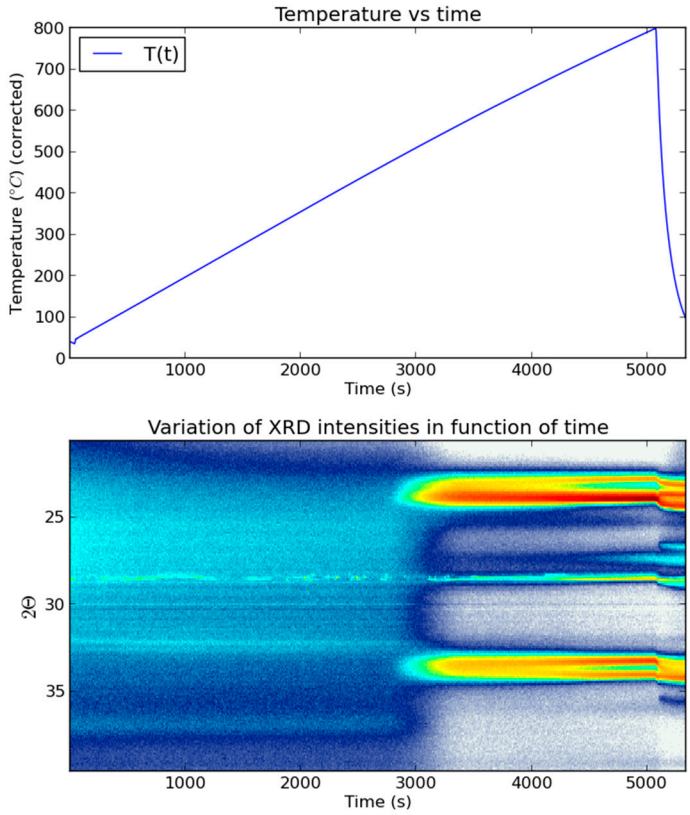

Figure S5. In-situ XRD results showing applied temperature profile (top), as well as (bottom) diffraction intensity as function of peak position and time. Both graphs are based on the same sample; W-citrate deposited using 10 cycles on TiN micro-cylinders at a deposition temperature of 180 °C.