

Supporting information

Capillary based Li-air batteries for *in situ* synchrotron X-ray powder diffraction studies

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Figure S1: A photo of the capillary battery.

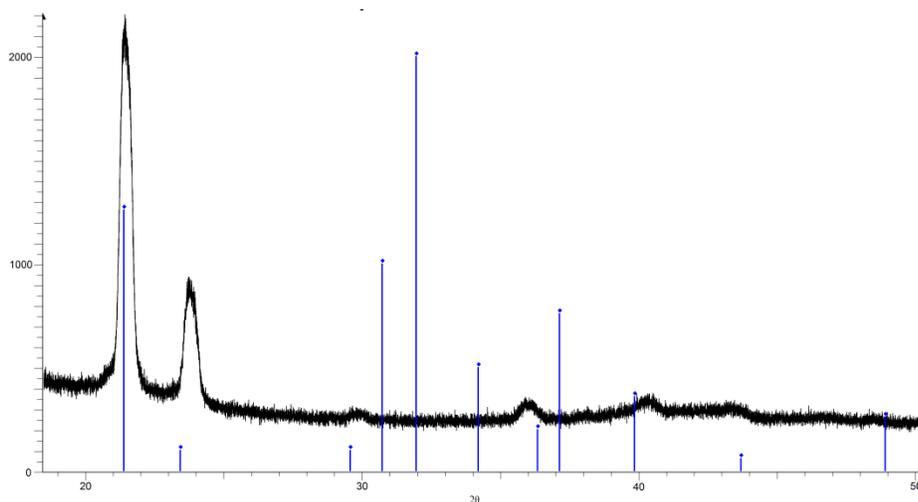


Figure S2: A 5 times discharged cathode. Blue lines: diffraction pattern of Li_2CO_3 .

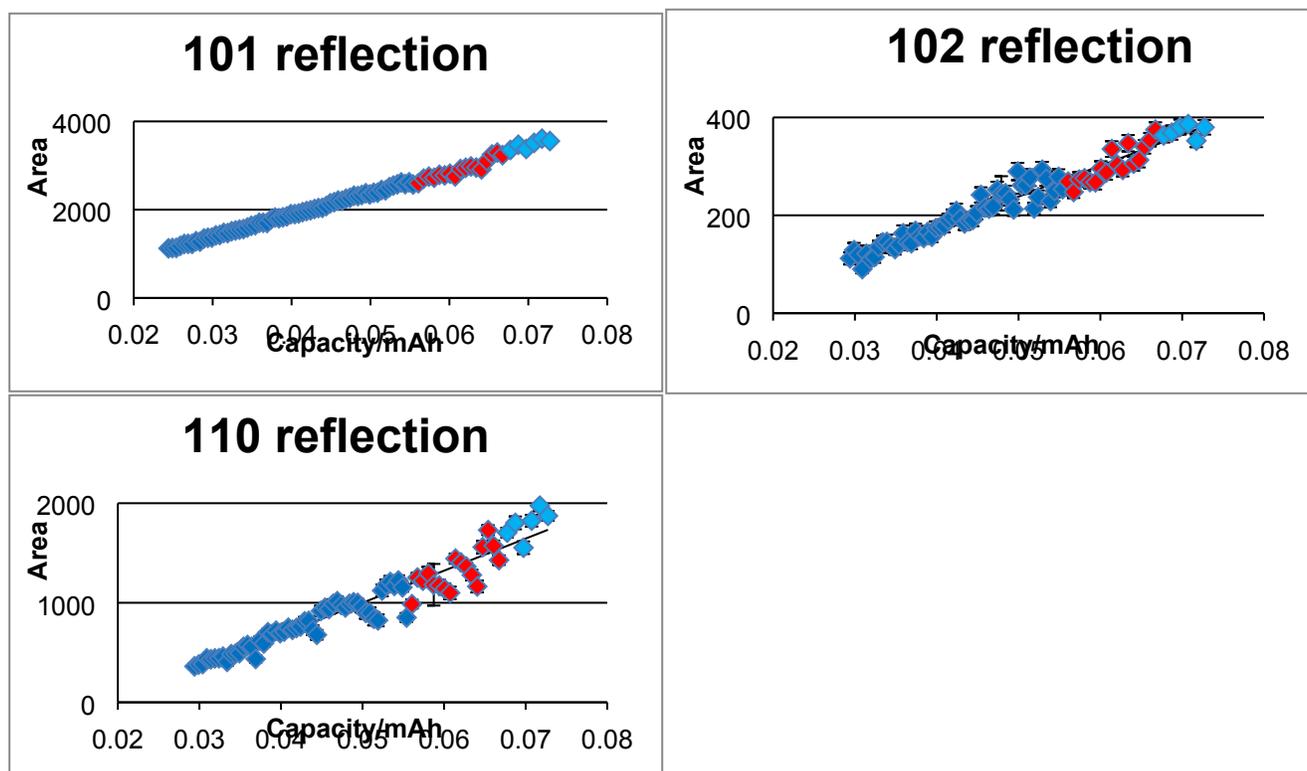
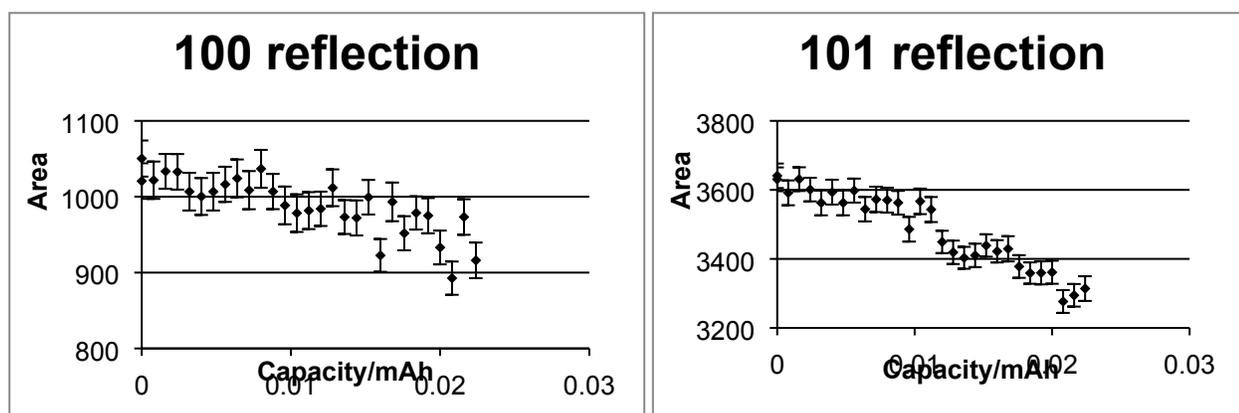


Figure S3: The development of the areas of the reflections as a function of capacity during discharge for the 101, 102 and 110 reflections for battery 1.



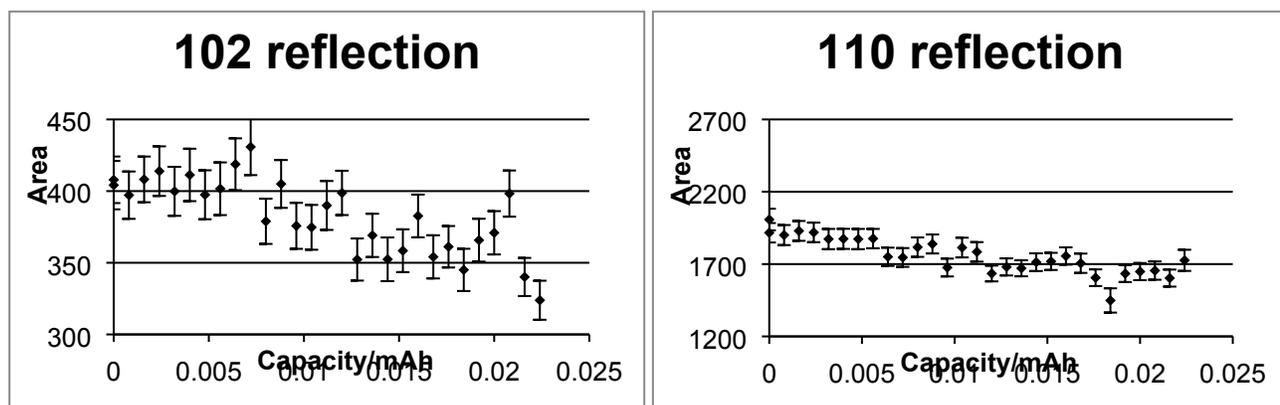


Figure S4: The development of the areas of the reflections for the first charge of battery 1 for the 100, 101, 102 and 110 reflections.

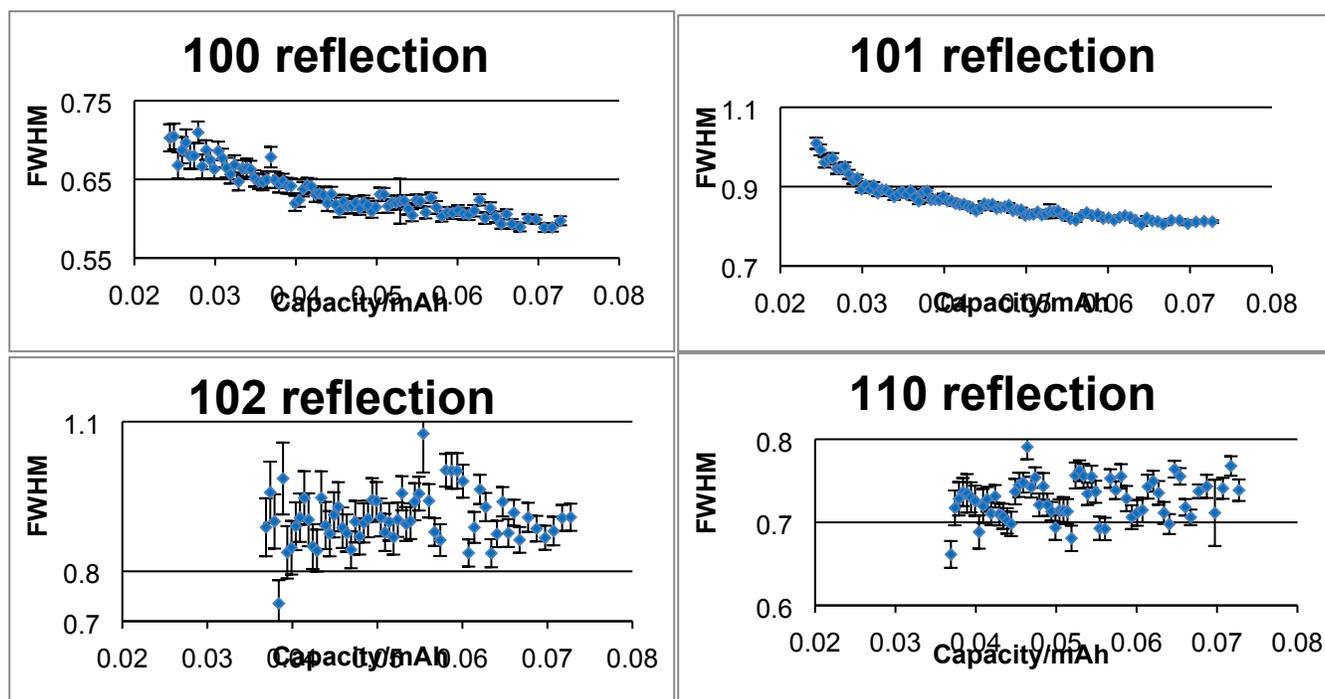


Figure S5: The development of the FWHM during discharge of battery 1 for the 100, 101, 102 and 110 reflections.

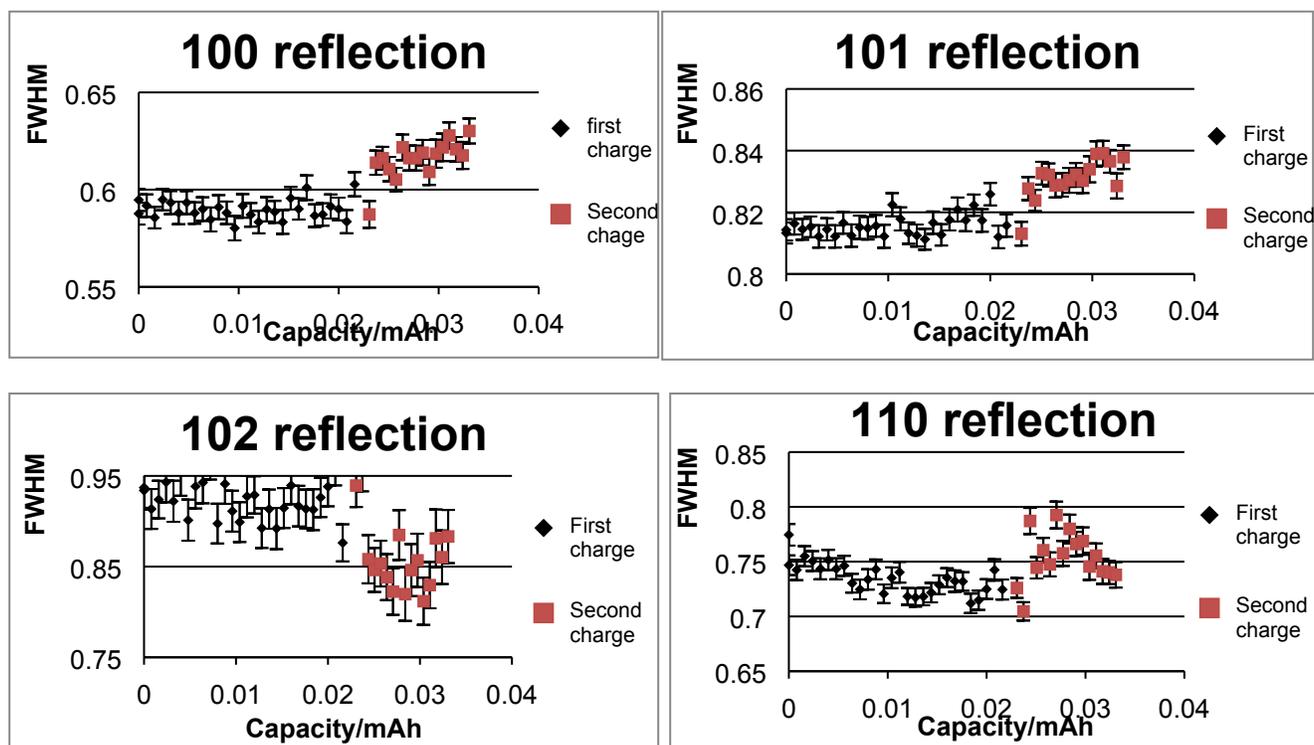


Figure S6: The development of the FWHM during charging of battery 1 for the 100, 101, 102 and 110 reflections.

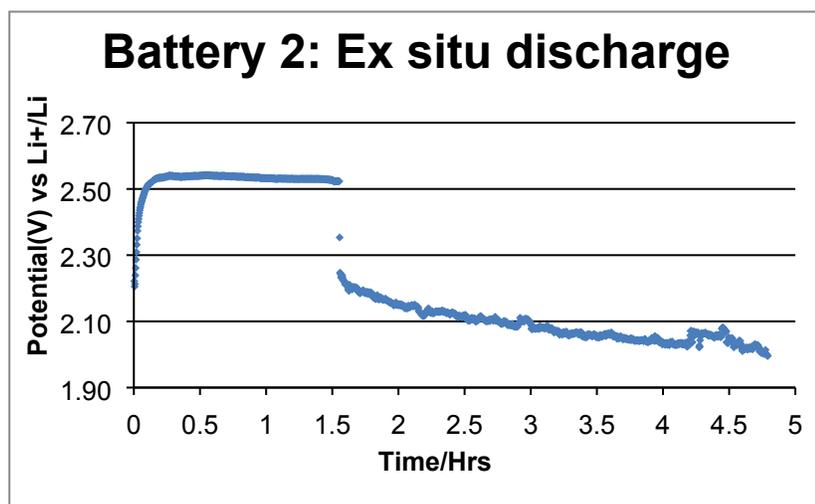


Figure S7: The discharge curve of battery 2

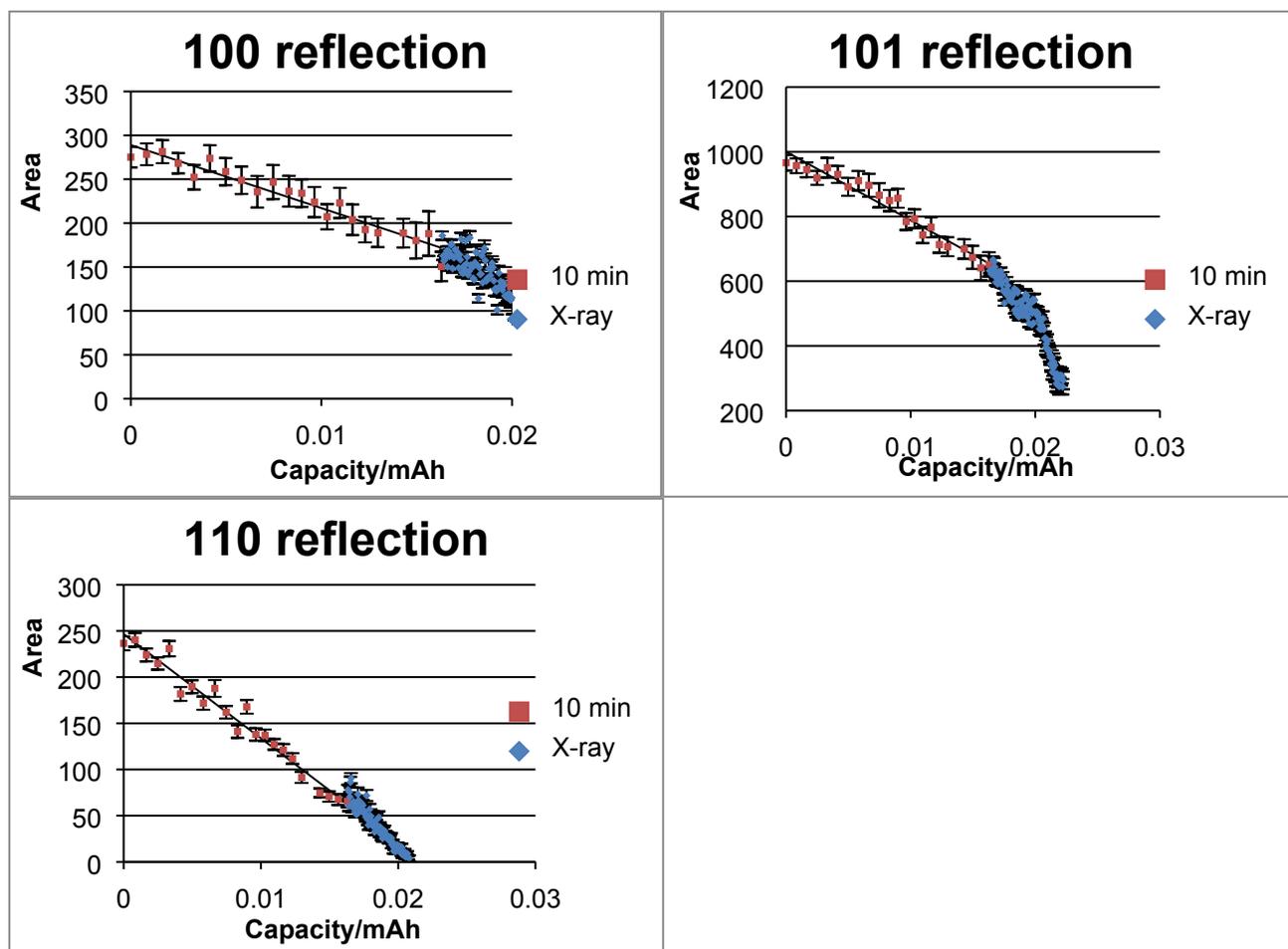


Figure S8: The decomposition of the Li_2O_2 reflections in battery 2 as a function of capacity, depending on a 10 minutes exposure to X-ray or constant X-ray exposure. The left equation is for the 10 minutes measurements and the right equation is for the constant X-ray exposure.

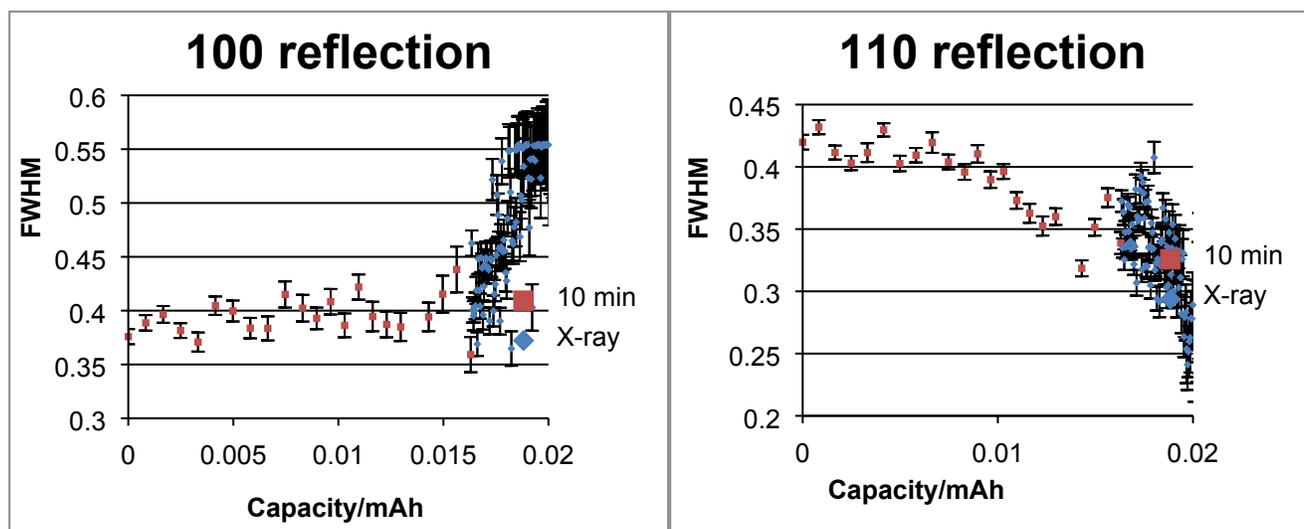


Figure S9: The development of the FWHM for battery 2, both with and without constant X-ray exposure. The upper limit reached for the 100 reflections is due to the fitting procedure for the data.

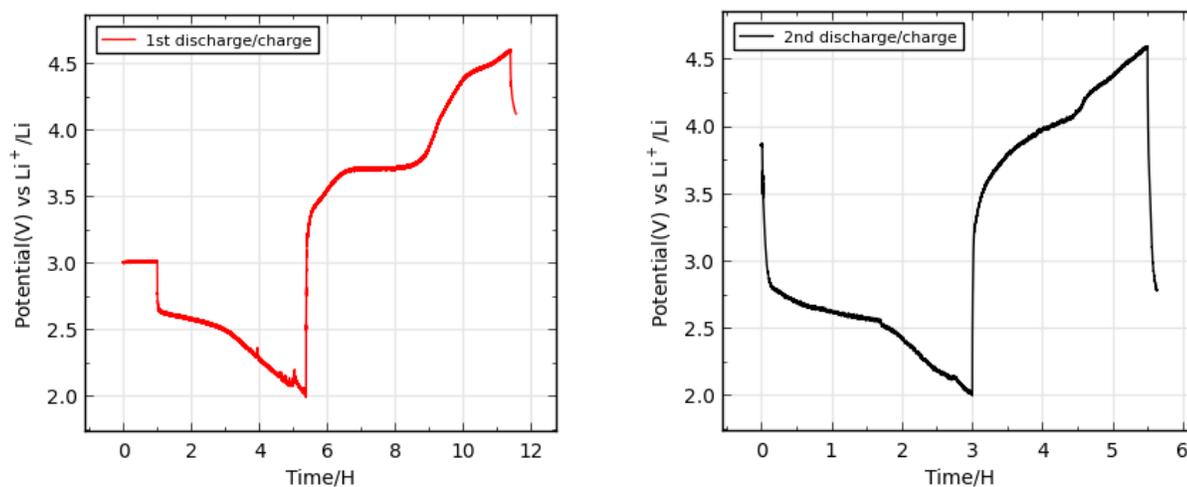


Figure S10: Left: The 1st discharge/charge curves of battery 3 measured at 4 μ A. Right: The 2nd discharge/charge curves of battery 3 measured at 5 and 6 μ A.

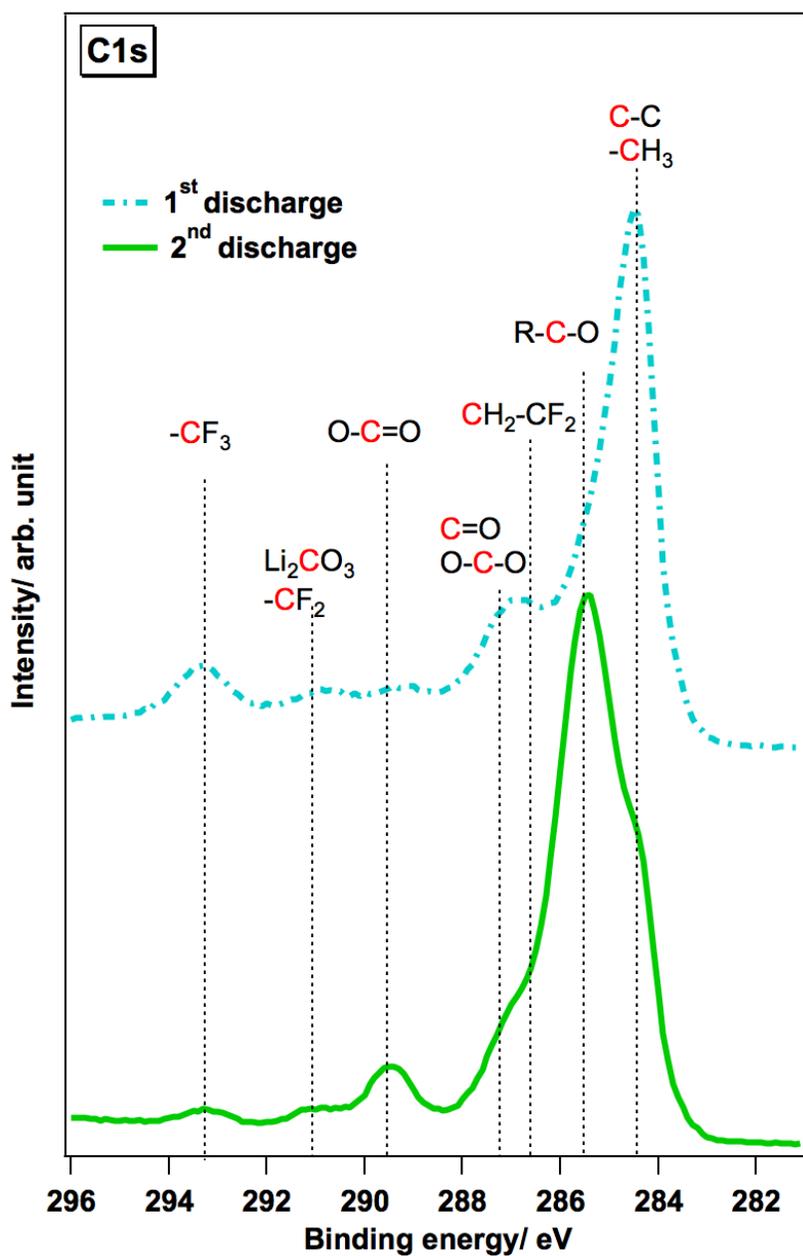


Figure S11: The C1s spectra of *ex situ* analyzed cathodes after 1st discharge (blue/-.-.) or 2nd discharge (green/—) in the capillary Li-O₂ battery.