BATTERIES & SUPERCAPS

Supporting Information

Engineering of Sn and Pre-Lithiated Sn as Negative Electrode Materials Coupled to Garnet Ta-LLZO Solid Electrolyte for All-Solid-State Li Batteries

Giulio Ferraresi,* Sven Uhlenbruck, Chih-Long Tsai, Petr Novák, and Claire Villevieille*An invited contribution to a Special Collection dedicated to the Symposium on Batteries and Supercapacitors at the E-MRS Spring Meeting 2019

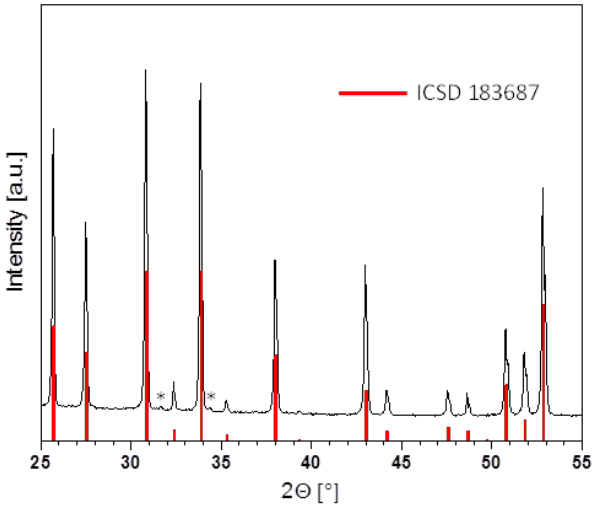

Figure S1. X-ray diffraction pattern of LLZTa solid electrolyte pellet compare to the cubic LLZTa reference sample (ICSD card n° 18 36 87).

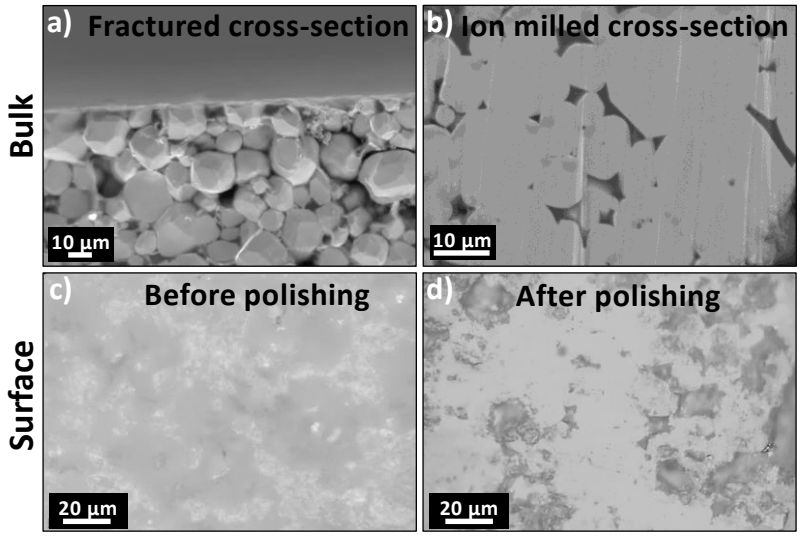

Figure S2. SEM images of LLZTa samples: a) manually “fractured” cross-section, b) “ion-milled” cross-section, c) surface of the LLZTa pellet before polishing, d) surface of the LLZTa pellet after polishing.

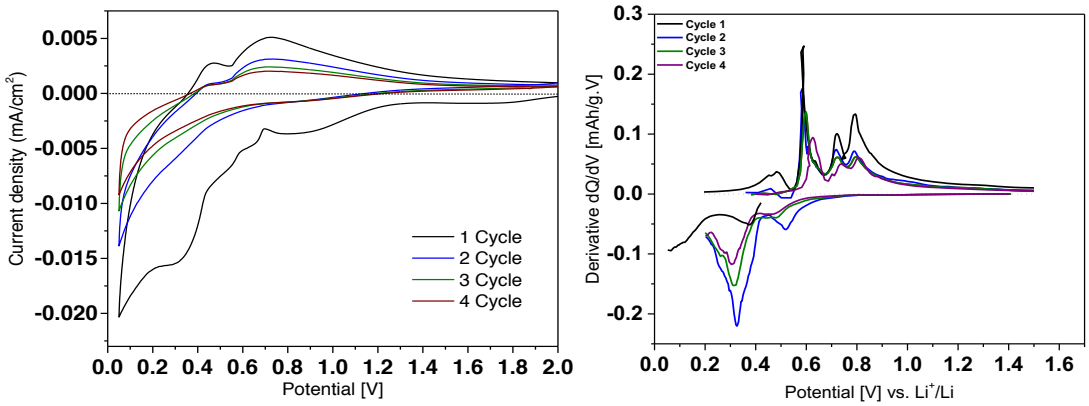

Figure S3. (left) CV of a Sn composite electrode with micro particles vs. Li metal at scan rate of 50 μV/s; (right) Derivative curves of galvanostatic measurements, presented in Figure 4 for Sn nano-sized particles (100 nm).

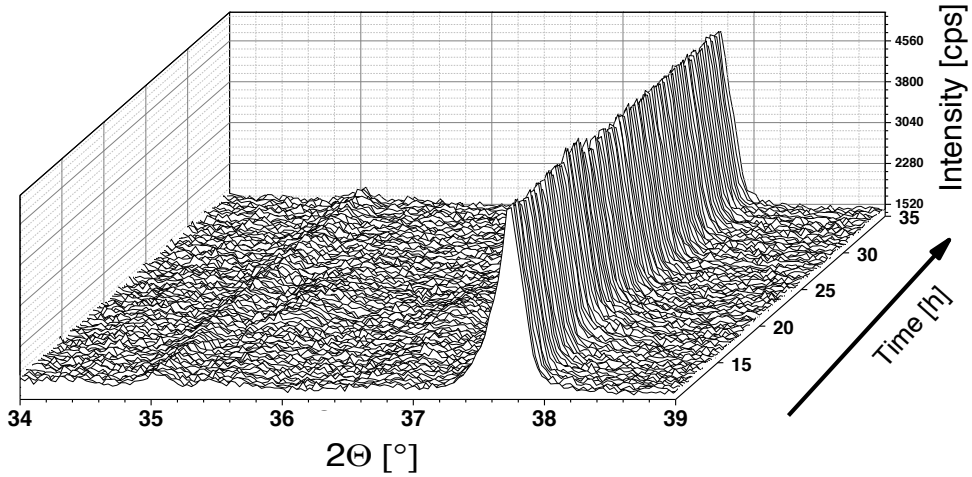

Figure S4. Waterfall representation of selected 40-140 scans (corresponding to 10-35 h) extracted from the *operando* XRD measurement of an Sn composite electrode coated on LLZTa and cycled vs. Li metal at 90°C in the potential range 0.2 – 1.6 V vs. Li^{+}/Li at C/50 rate