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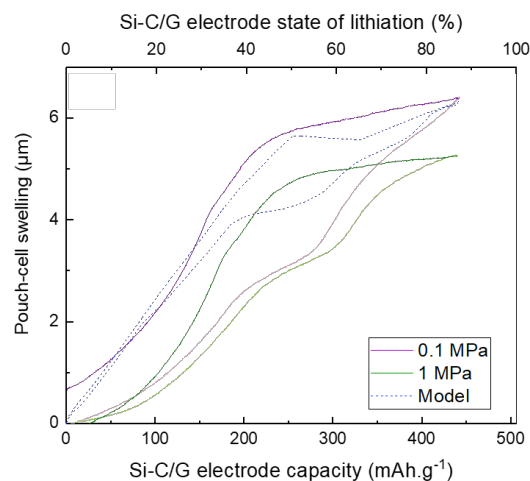
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Silicon lithiation induces a high material expansion which leads to significant swelling and mechanical pressure at the anode and cell level. The operando swelling behaviour of bi-layer pouch cell with high performance silicon carbon graphite (Si-C/G) anode material will be presented using an in-house high precision ($< 0.1\mu\text{m}$) compression set-up with simultaneous pressure and thickness recording as well as dynamic pressure regulation system [1]. Results will be presented for various cell designs in terms of electrode balancing, anode porosity or external pressure level. Combining this set-up and a 1D modelling of active material (graphite, silicon, NMC622) swelling in function of the SOC [2] it is possible to provide insights in porosity changes of anode.



Relative thickness obtained from 1D modelling considering constant anode porosity and operando swelling measurement in pouch cell for the 4th cycle at 0.1 or 1 MPa.

References

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2. A.J. Louli, J. Li, S. Trussler, C.R. Fell, J.R. Dahn, Volume, Pressure and Thickness Evolution of Li-Ion Pouch Cells with Silicon-Composite Negative Electrodes, *Journal of Electrochemical Society*, 164, A2689–A2696 (2017).