

追踪锂金属负极的压力与形貌变化

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Tracking Pressure Changes and Morphology Evolution of Lithium Metal Anodes

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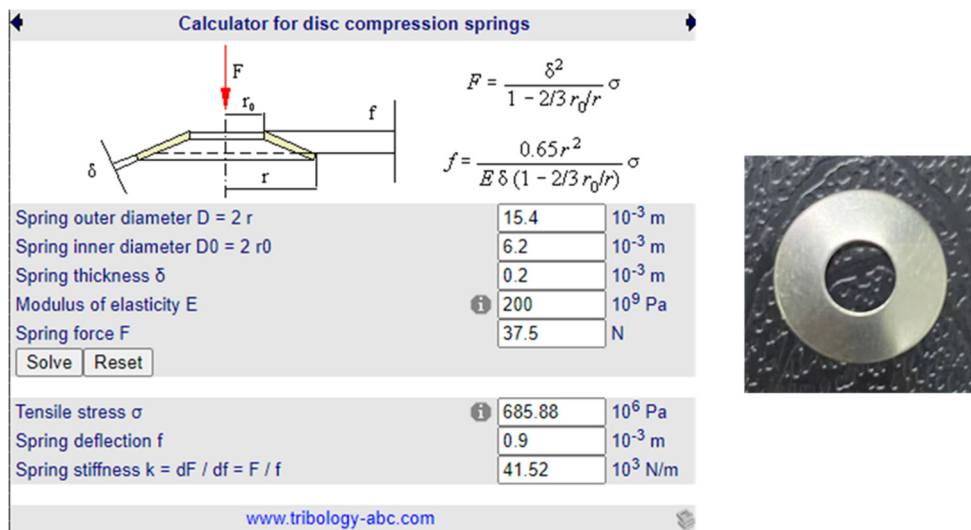


Fig. S1 Estimation of the maximum spring force applied by the coin cell spring.

We used an online calculator to estimate the maximum spring force. The spring outer diameter (D) is 15.4 mm ($1 \text{ mm} = 10^{-3} \text{ m}$); the inner diameter (D_0) of the spring is 6.2 mm; the spring thickness (δ) is 0.2 mm; the total height of the spring is 1.1 mm. The spring is made of 304-grade stainless steel, which has a modulus of elasticity (E) of $\sim 200 \text{ GPa}$ ($1 \text{ GPa} = 10^9 \text{ Pa}$). The largest possible spring deflection is $1.1 - 0.2 = 0.9 \text{ mm}$ (when the spring is “flattened”), which gives a spring force of $\sim 37.5 \text{ N}$. The area of the electrode is $\sim 0.785 \text{ cm}^2$. Therefore, we estimate that the maximum pressure is $\sim 0.47 \text{ MPa}$.

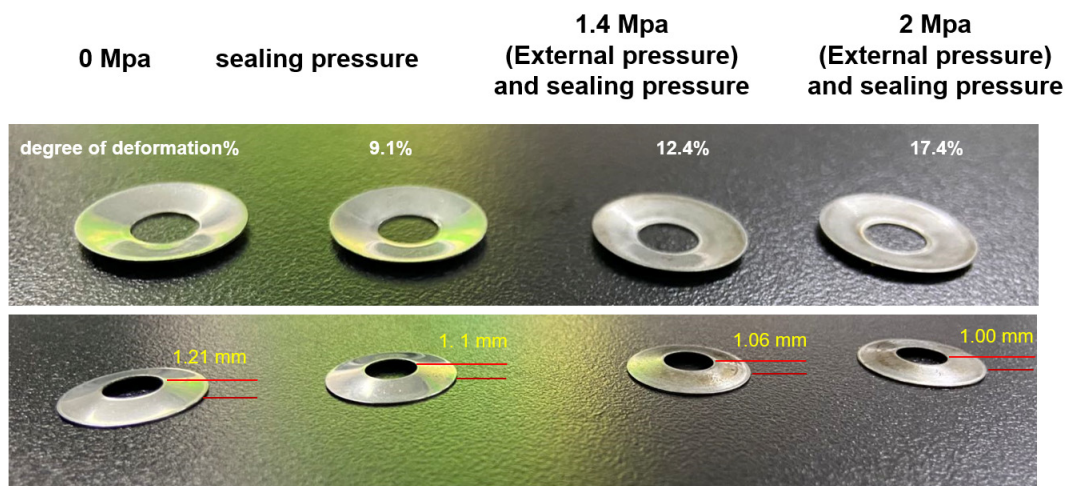


Fig. S2 Photos of the disc springs.

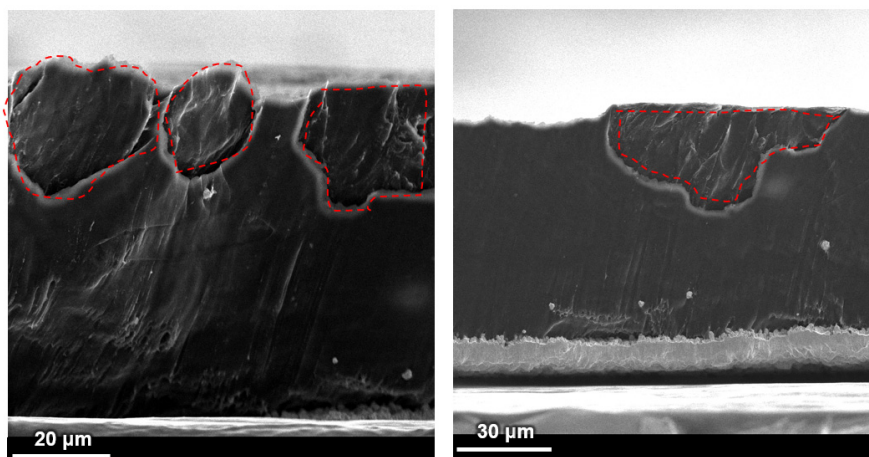


Fig. S3 Additional cross-sectional SEM images collected from the Li anode after the first charge under an initial pressure of 1.7 MPa.