

## Supplementary information

### Monitoring of electro–chemo–mechanics in Li metal electrodes by optical fibre sensors

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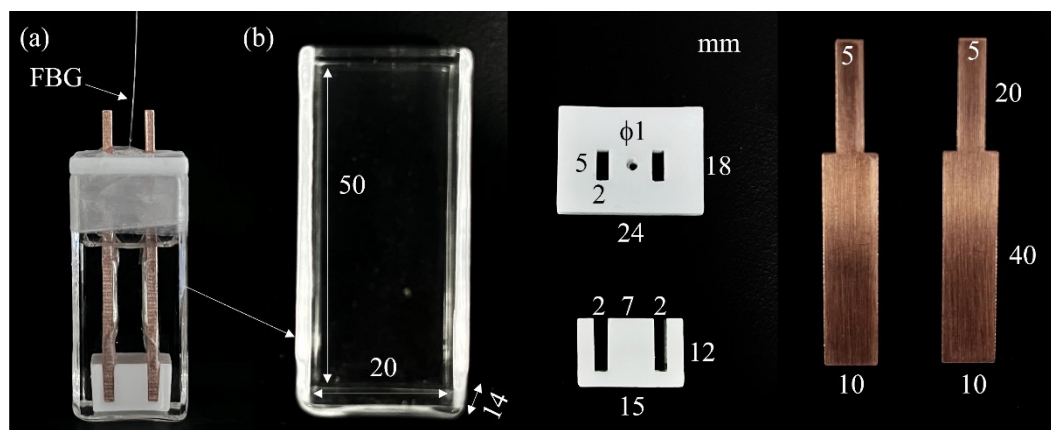


Figure S1 | (a) the assembled Li metal battery and (b) the structure parameters of customized fixture.

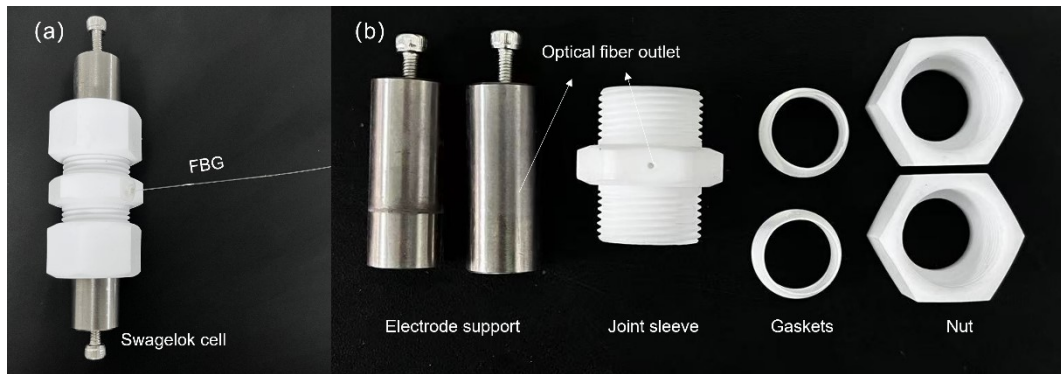


Figure S2 | (a) the assembled lithium titanate -lithium Swagelok cell and (b) its custom structural parts

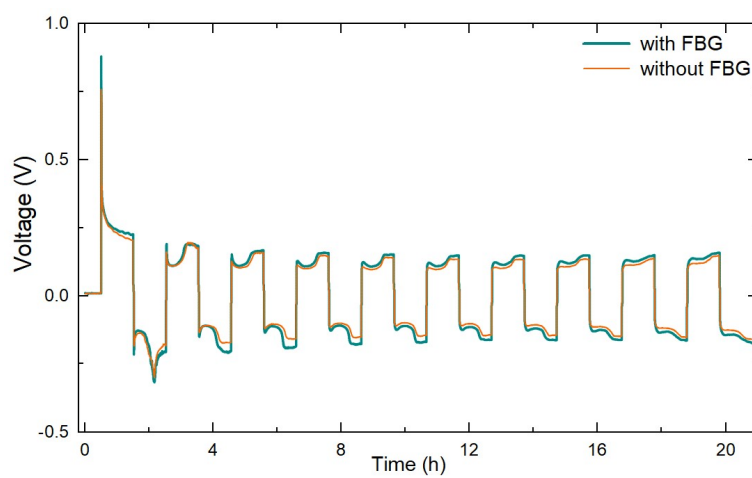


Figure S3 | The voltage curves of Li symmetrical cells with and without FBG

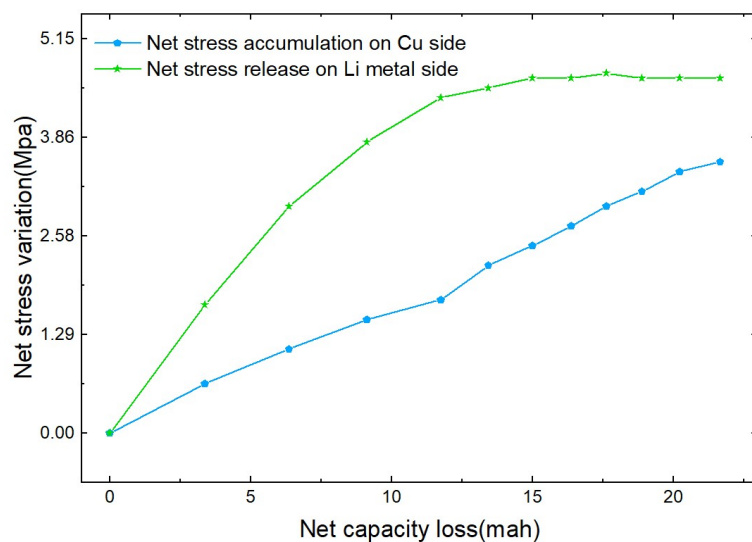


Figure S4 | The net stress variation on Cu side and Li metal side along with the Net capacity loss.

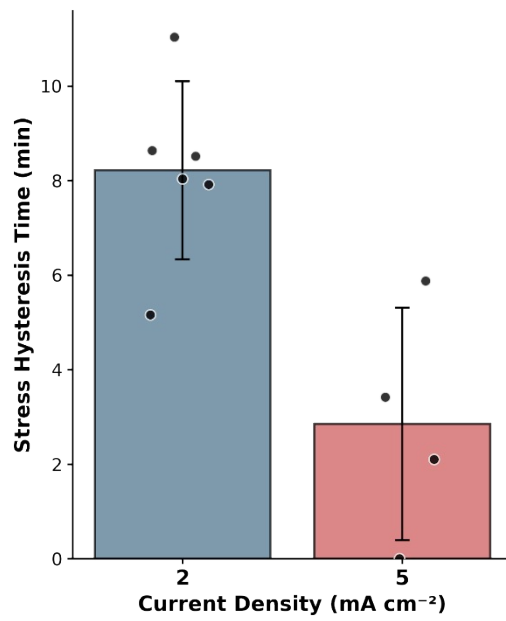


Figure S5 | The quantitative comparison between hysteresis time and current density.