

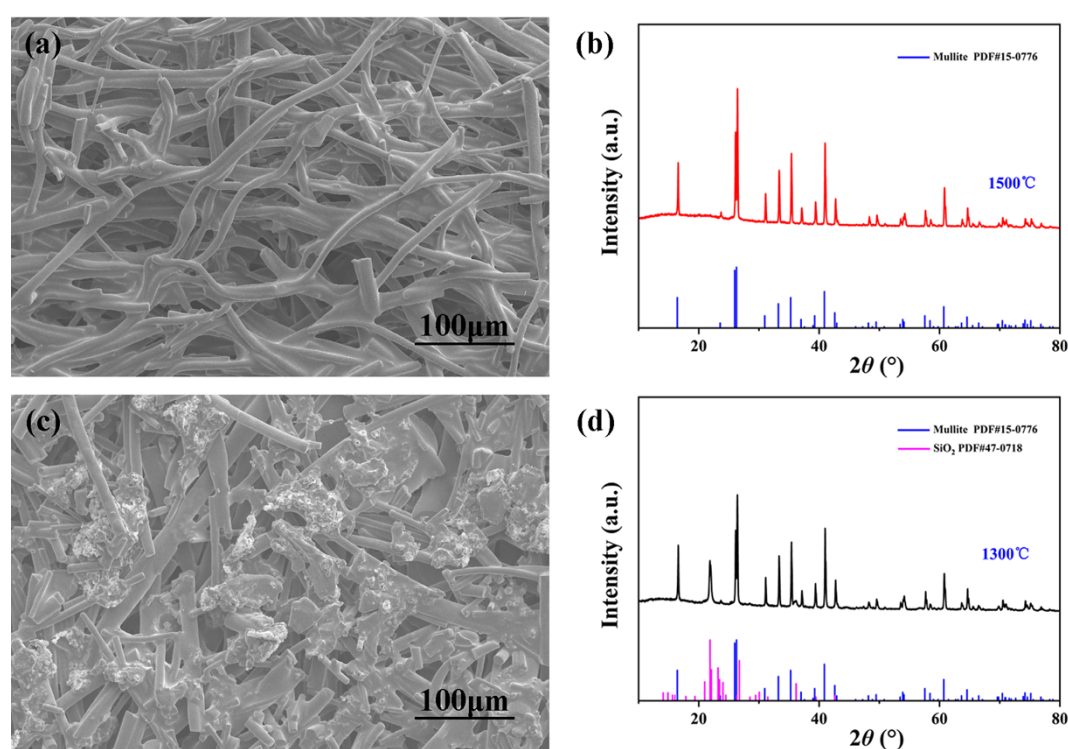
## Application of 3D Mullite Fiber Matrix as a Lithiophilic Interlayer in Lithium Metal Anode

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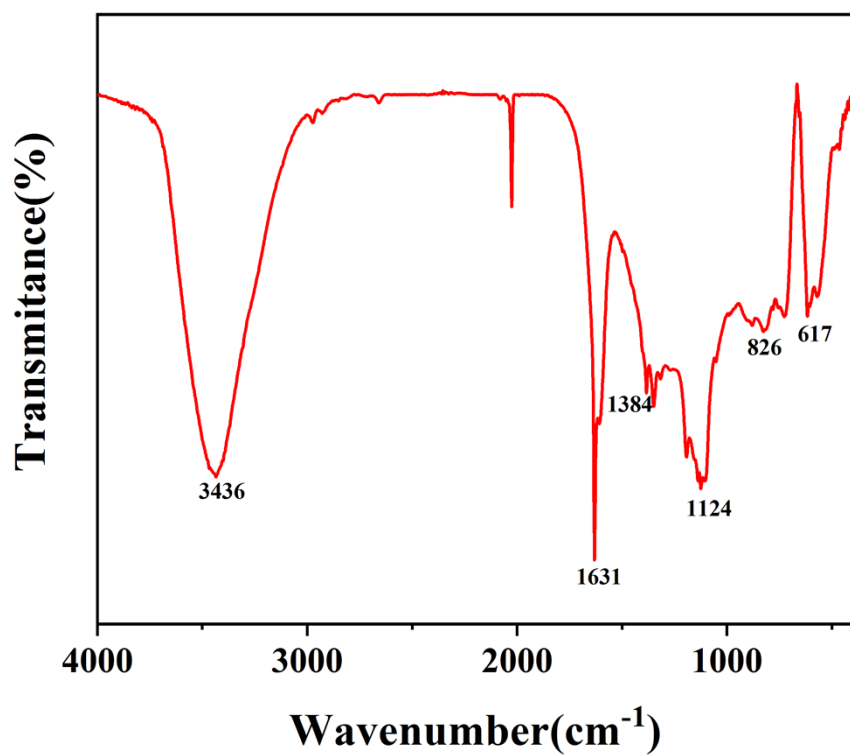
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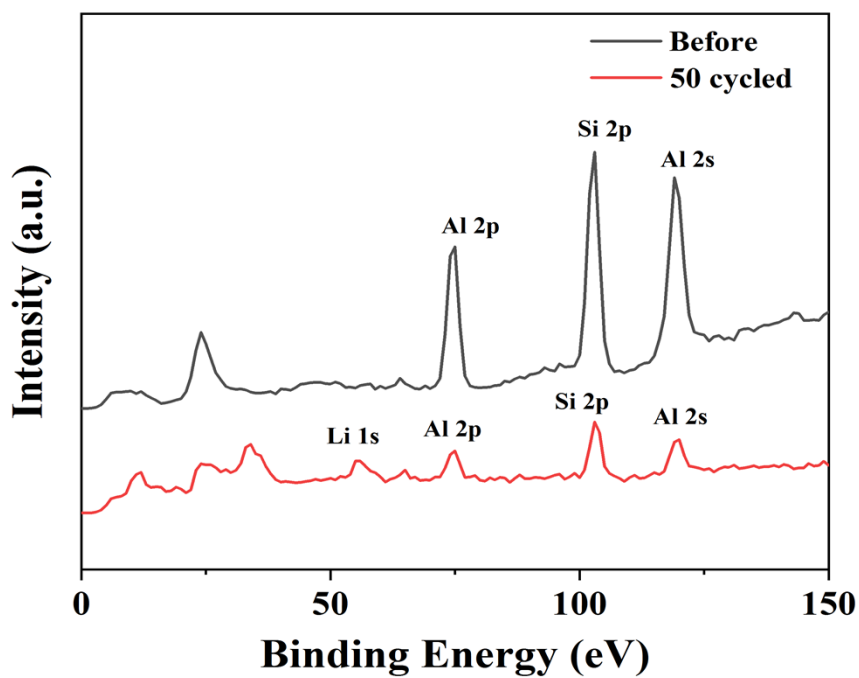
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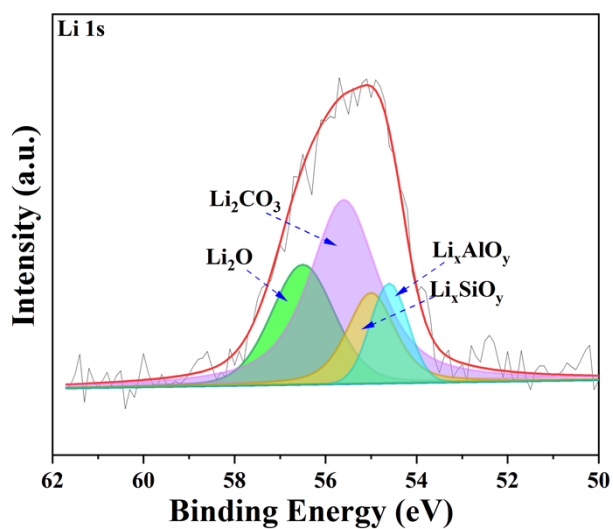
**Figure S1.** SEM images and XRD patterns of 3D mullite fiber sheet sintering at 1500°C (a, b) and 1300°C (c,d).



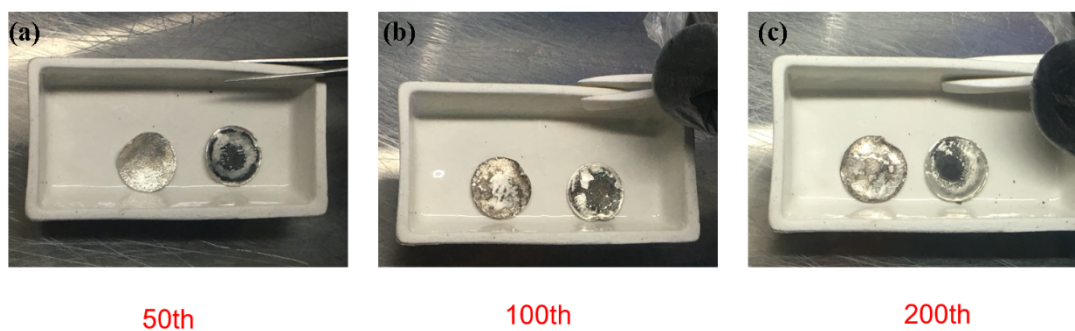
**Figure S2.** FTIR spectrum of mullite fiber sheet.



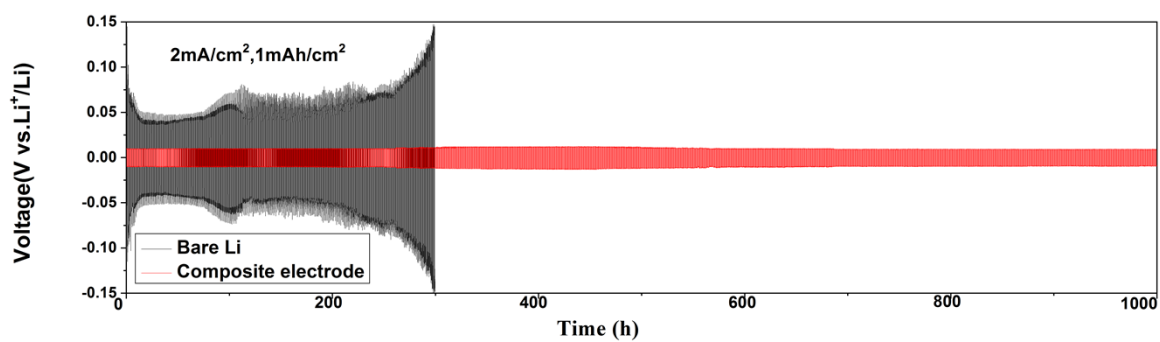
**Figure S3.** XPS survey spectrum of the 3D mullite fiber sheet.



**Figure S4.** High-resolution XPS spectra of Li 1s for 3D mullite fiber sheet after 50 cycles.



**Figure S5.** Optical observation of mullite fibers/Li composite electrode (left) and bare Li electrode (right) surface appearance at a current density of  $1.0 \text{ mA}\cdot\text{cm}^{-2}$  with  $0.5 \text{ mAh}\cdot\text{cm}^{-2}$  after different cycles, 50th (a), 100th (b), 200th (c).



**Figure S6.** Comparisons of cycling performance between bare Li and mullite fibers/Li

composite electrode symmetric cells at a current density of  $2.0 \text{ mA}\cdot\text{cm}^{-2}$  with  $1 \text{ mAh}\cdot\text{cm}^{-2}$ .