

Supporting information

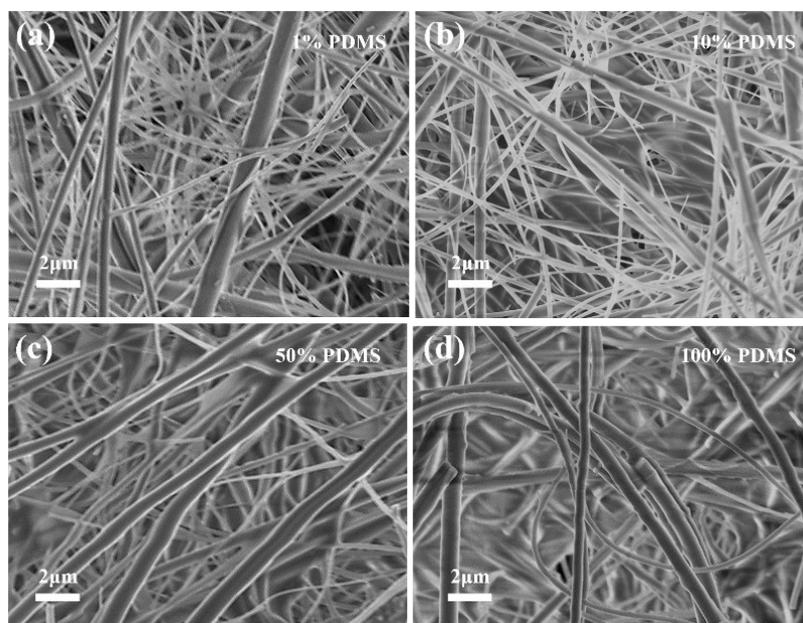


Fig. S1 SEM images of the surface of glass fiber separator modified with different concentrations of (a) 1% PDMS; (b) 10% PDMS; (c) 50% PDMS; (d) 100% PDMS.

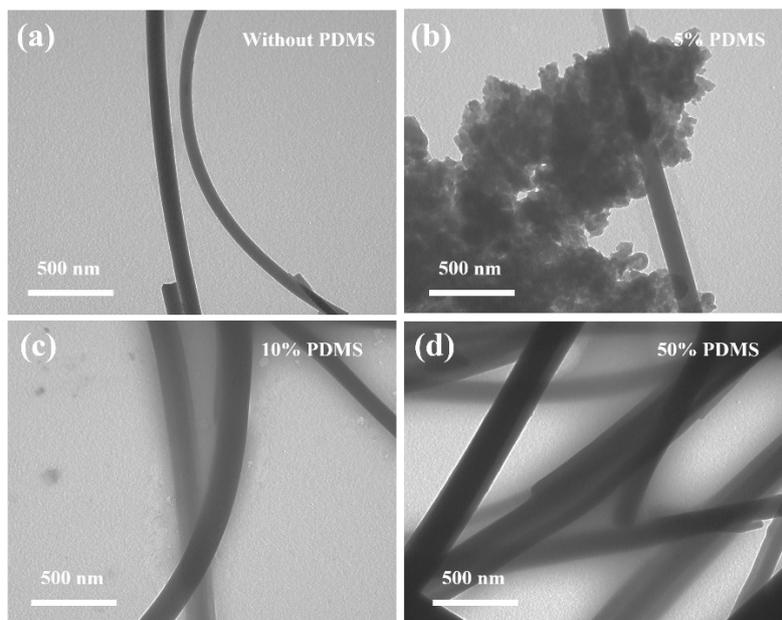


Fig. S2 TEM images of (a) unmodified-GF, (b) 5% PDMS-GF, (c) 10% PDMS -GF and (d) 50% PDMS-GF.

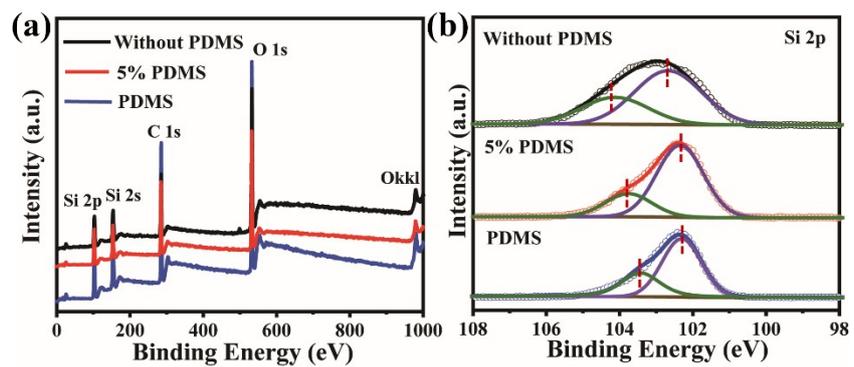


Fig. S3 (a) XPS survey spectrum and (b) Si 2p XPS spectra of the glass fiber separator before and after 5% PDMS modification and the pure PDMS.

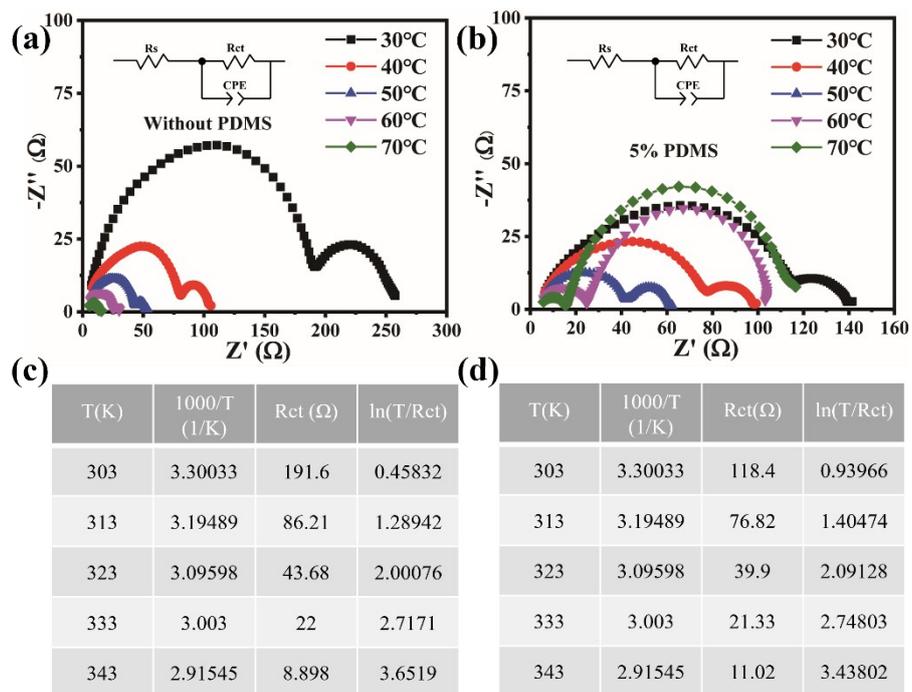


Fig. S4 Nyquist plots at various temperatures for Li/Li cells with (a) unmodified-GF and (b) 5% PDMS-GF. Inset is the equivalent circuit model used for fitting. Corresponding data under various temperatures are listed in (c) and (d).

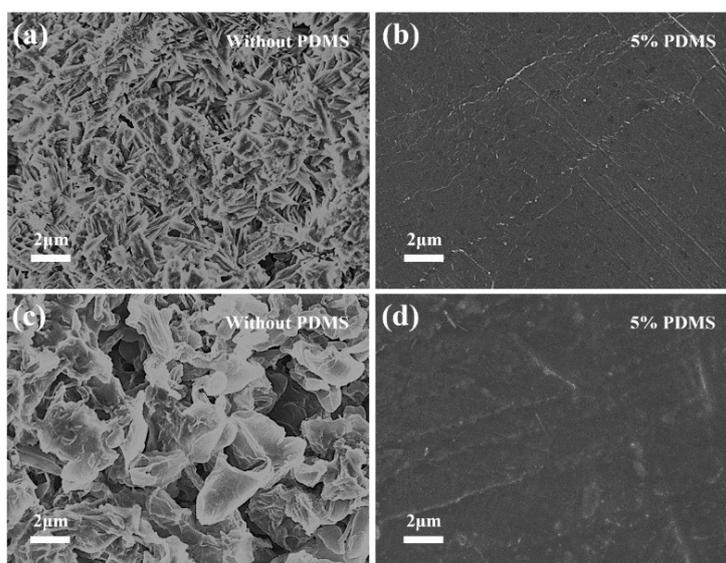


Fig. S5 SEM images of the lithium metal anode after 20 cycles at a current density 1 mA cm^{-2} and with a capacity of 2 mAh cm^{-2} (a) and (b); 5 mAh cm^{-2} (c) and (d). With and without 5% PDMS-GF are placed on the left and right sides, respectively.

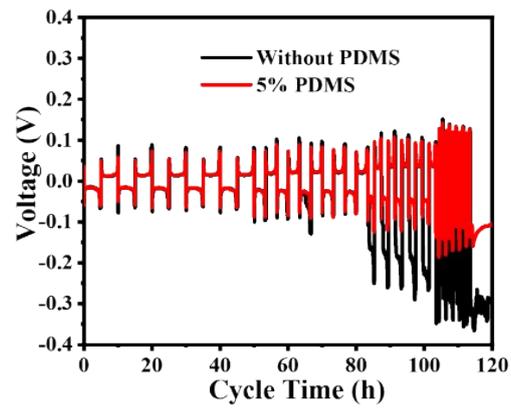


Fig. S6 Rate performance of symmetrical batteries at current densities from 0.2 to 1 mA cm⁻² with 1 mAh cm⁻².

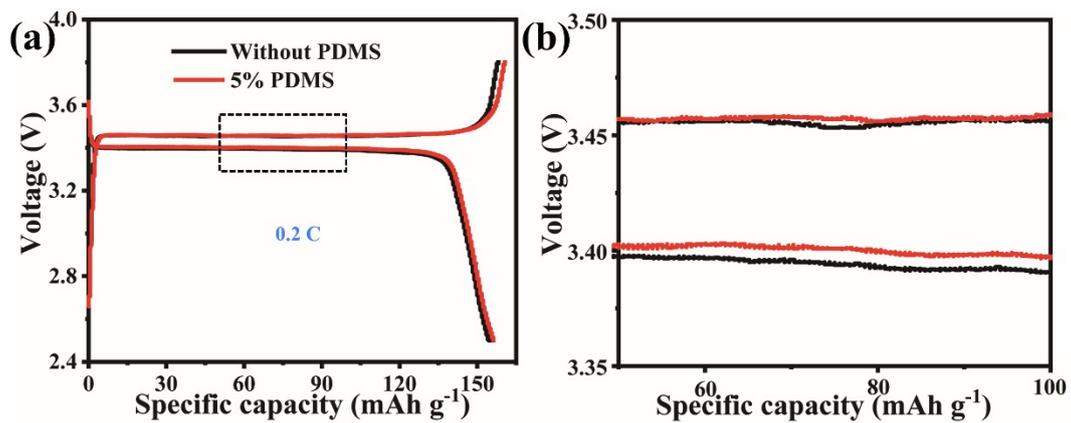


Fig. S7 (a) Charge-discharge curves of the assembled battery with and without PDMS modification at 0.2 C and (b) enlarged image of the dashed frame in (a).