Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Supplementary Information

Silica-nanoresin Crosslinked Composite Polymer Electrolyte for Ambient-Temperature All-Solid-State Lithium Batteries

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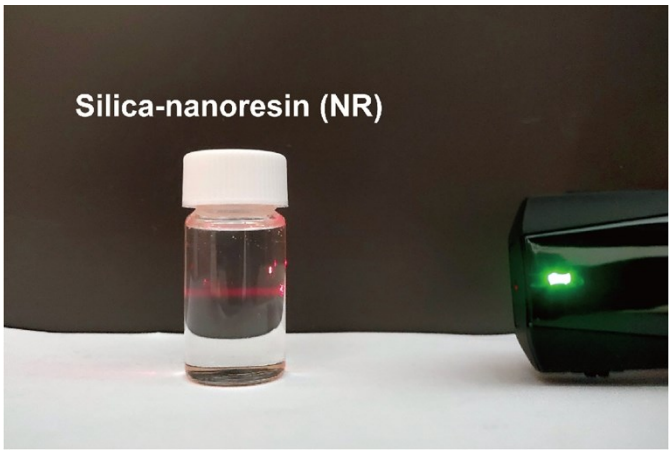

Fig. S1 Tyndall effect in silica-nanoresin.

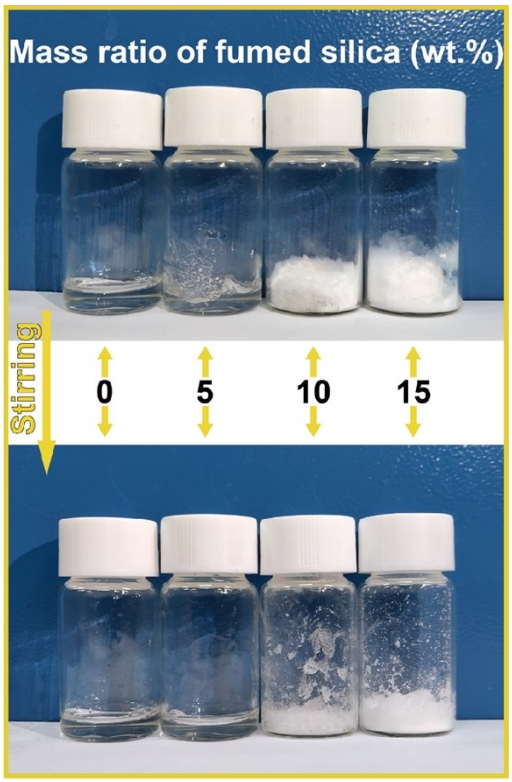

Fig. S2 Optical images of PVEC SPE with different mass ratio of nano fumed silica (0 wt.%, 5 wt.%, 10 wt.% and 15 wt.%, from left to right) before and after vigorous stirring.

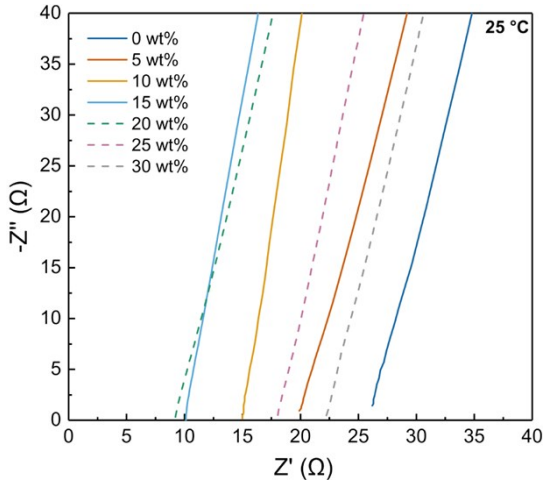

Fig. S3 EIS plots of PVEC-NR CPE with different mass ratio of NR at room temperature.

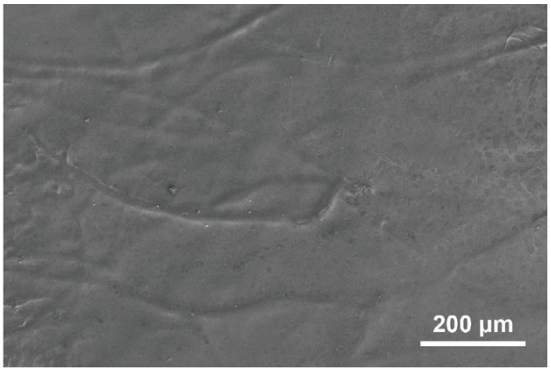

Fig. S4 Low-magnification surficial SEM image of PVEC-NR20 CPE.

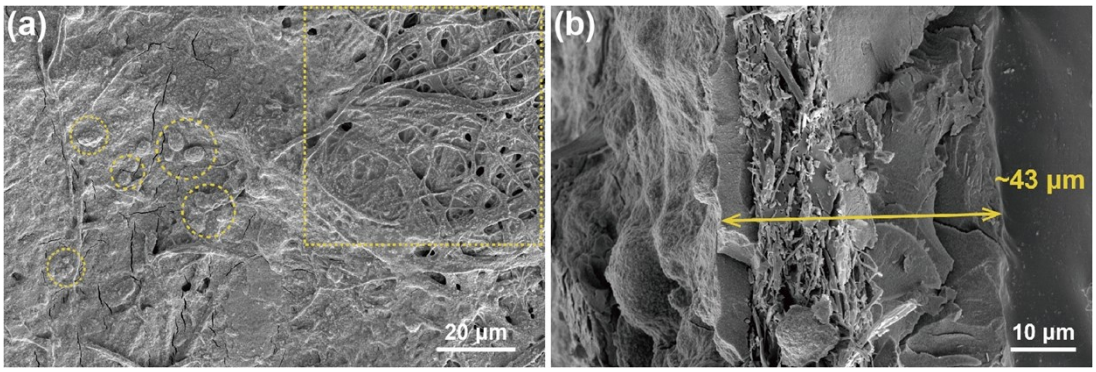

Fig. S5 SEM images of the surficial (a) and cross-sectional (b) morphologies of PVEC composite polymer electrolyte with 7 wt.% traditional fumed silica nanoparticles.

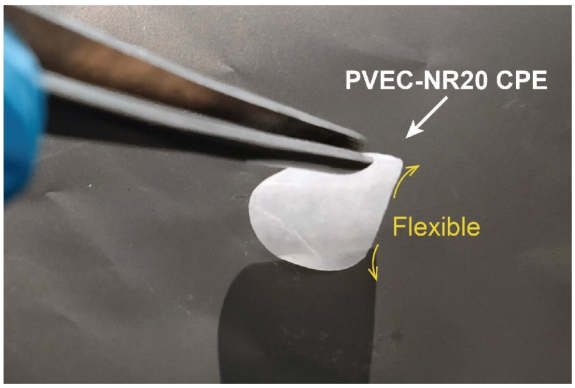

Fig. S6 Optical images of PVEC-NR20 CPE.

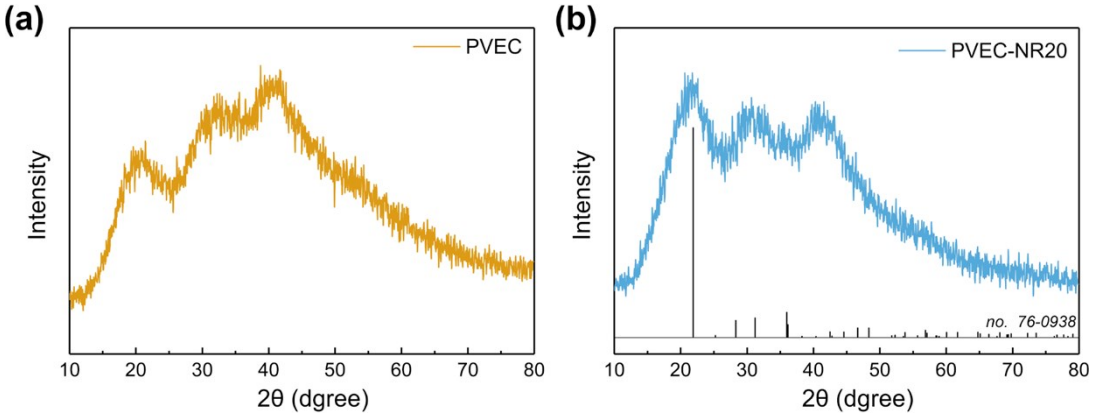

Fig. S7 XRD pattern of (a) PVEC polymer and (b) PVEC-NR20 composite polymer (without cellulose and Li salt).

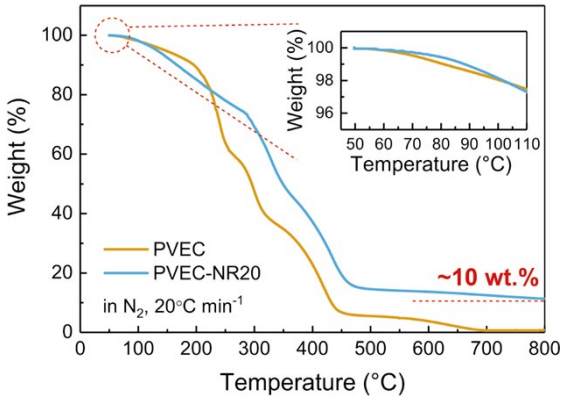

Fig. S8 TGA curves of PVEC-NR20 composite polymer (without cellulose and Li salt) in nitrogen from 50 to 800 °C with a scanning speed of 20 °C min^{-1}.

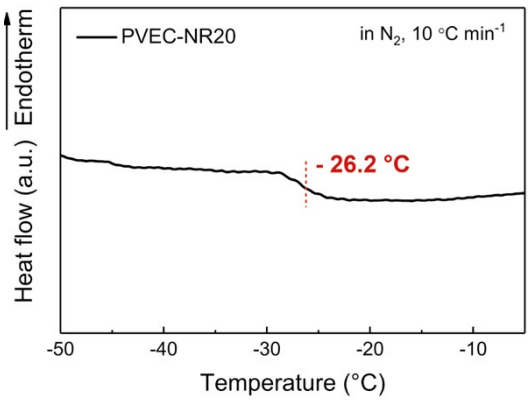

Fig. S9 DSC curves of PVEC-NR20 composite polymer (without cellulose and Li salt) in nitrogen with a scanning speed of 10 °C min^{-1}.

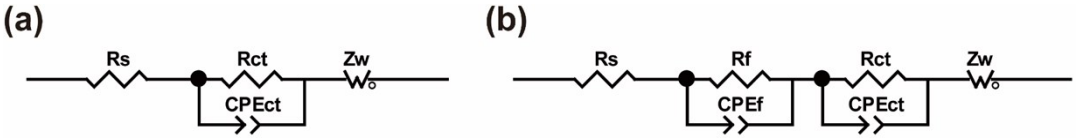

Fig. S10 Equivalent circuits of (a) uncycled and (b) cycled NCM523/Li cells at fully charged state (4.3 V).

Table. S1 Ionic conductivity values of PVEC-NR CPE with different contents of NR at room temperature

NR content (wt.%)	0	5	10	15	20	25	30
Conductivity (×10^{-4} S cm^{-1})	0.58	0.77	1.01	1.47	1.65	0.84	0.68