

## Electronic Supplementary Information

# Thiol-ene Synthesis and Characterization of Lithium Bis(malonato)borate Single-Ion Conducting Gel Polymer Electrolytes

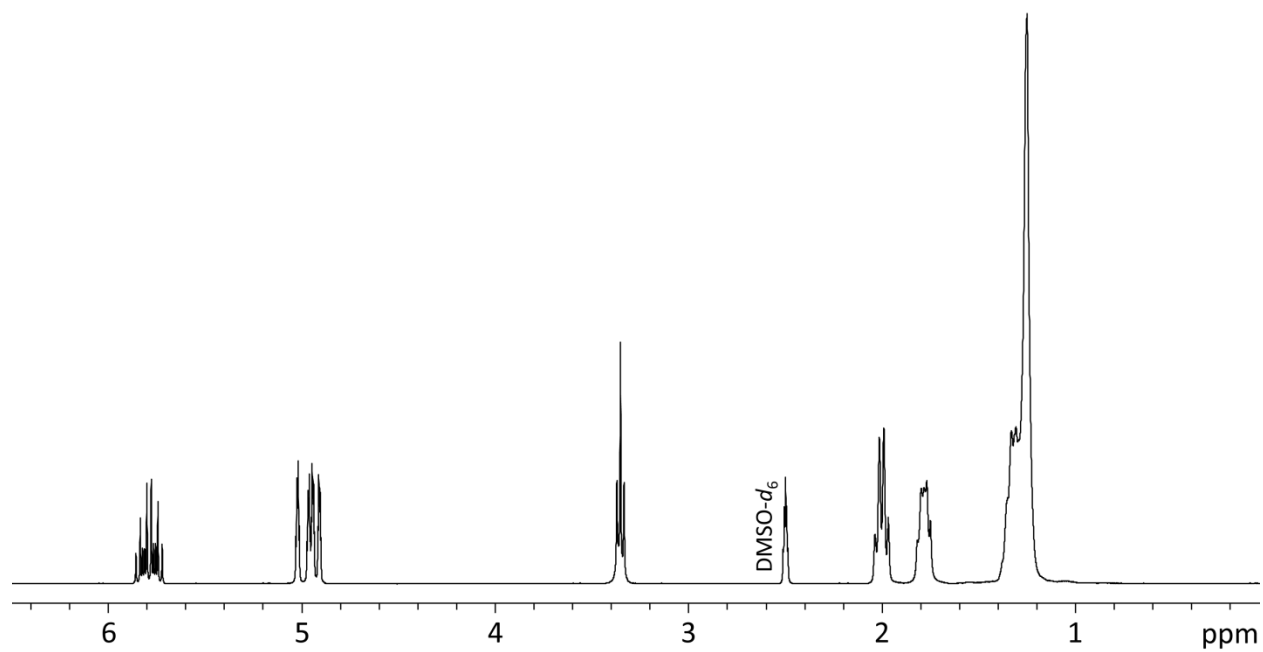
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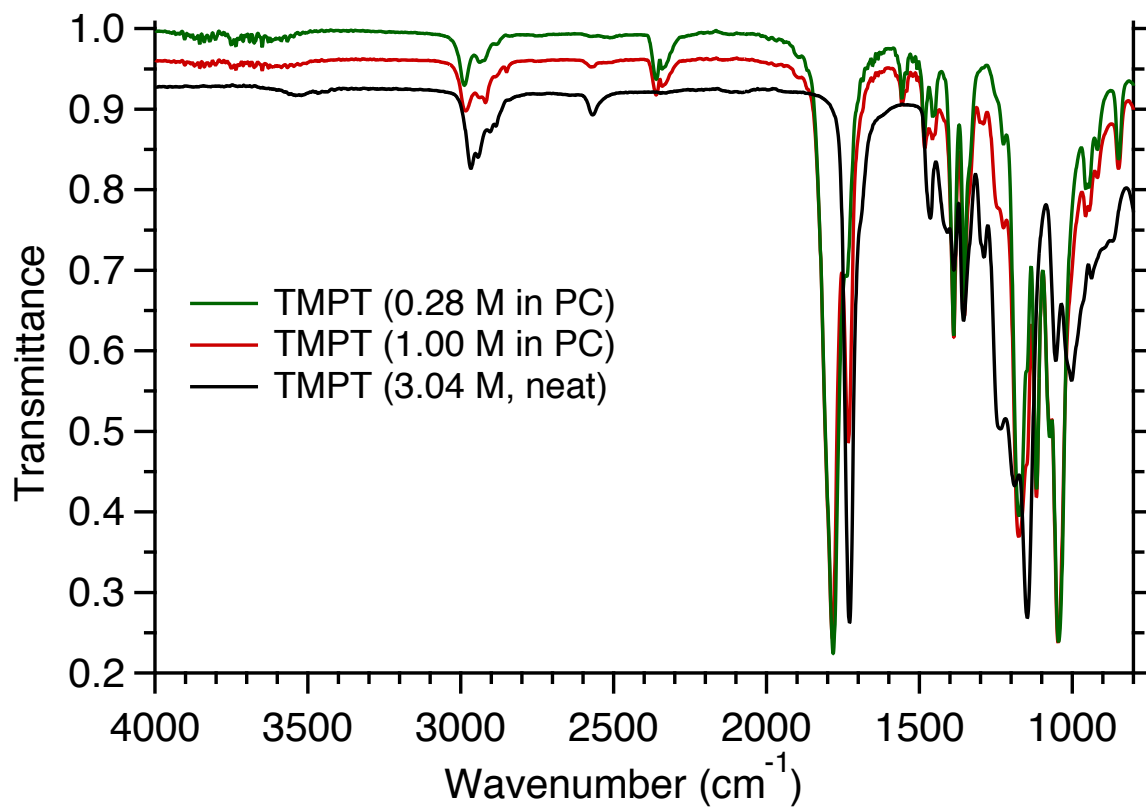
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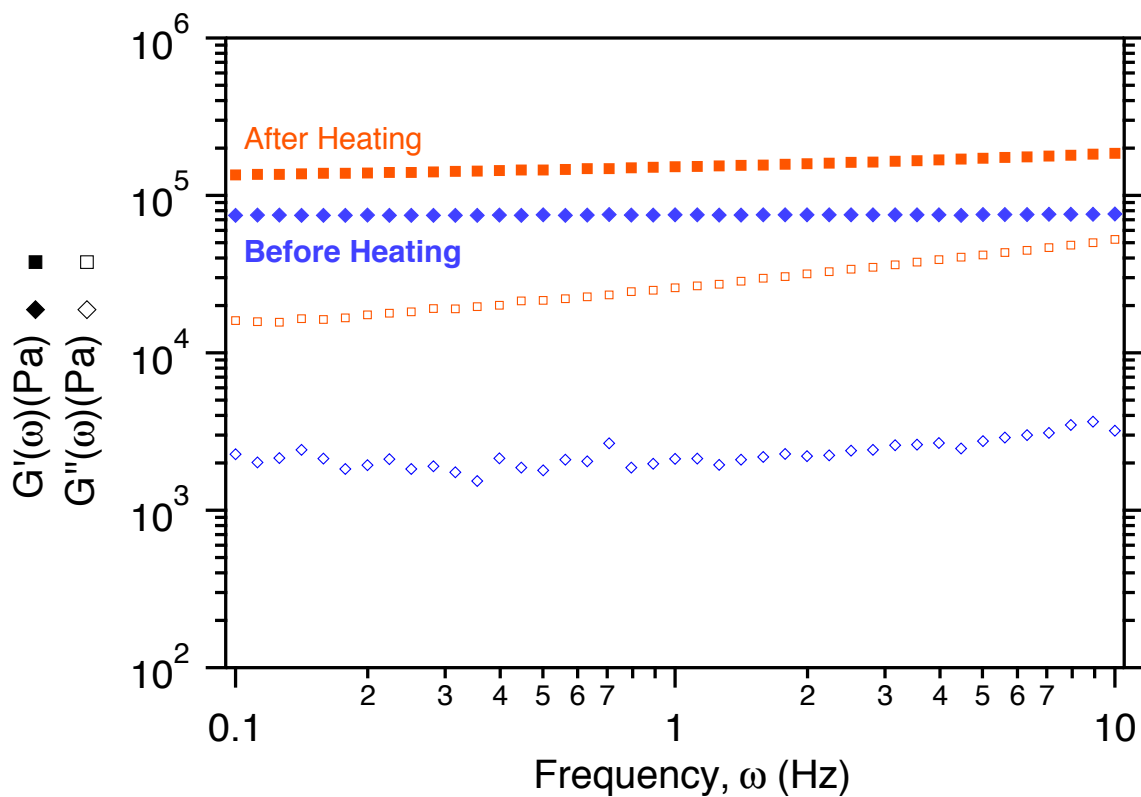
Table of Contents	Page
<b>Figure S1.</b> <sup>1</sup> H NMR Spectrum of LiBNMB	S2
<b>Figure S2.</b> Reference FTIR spectra of TMPT in PC at various concentrations	S3
<b>Figure S3.</b> Isothermal frequency sweep modulus measurement 40 °C before and after heating to 130 °C	S4
<b>Figure S4.</b> Representative FTIR spectra of 75CL before and after thermally induced failure in the hermetically sealed conductivity cell	S5



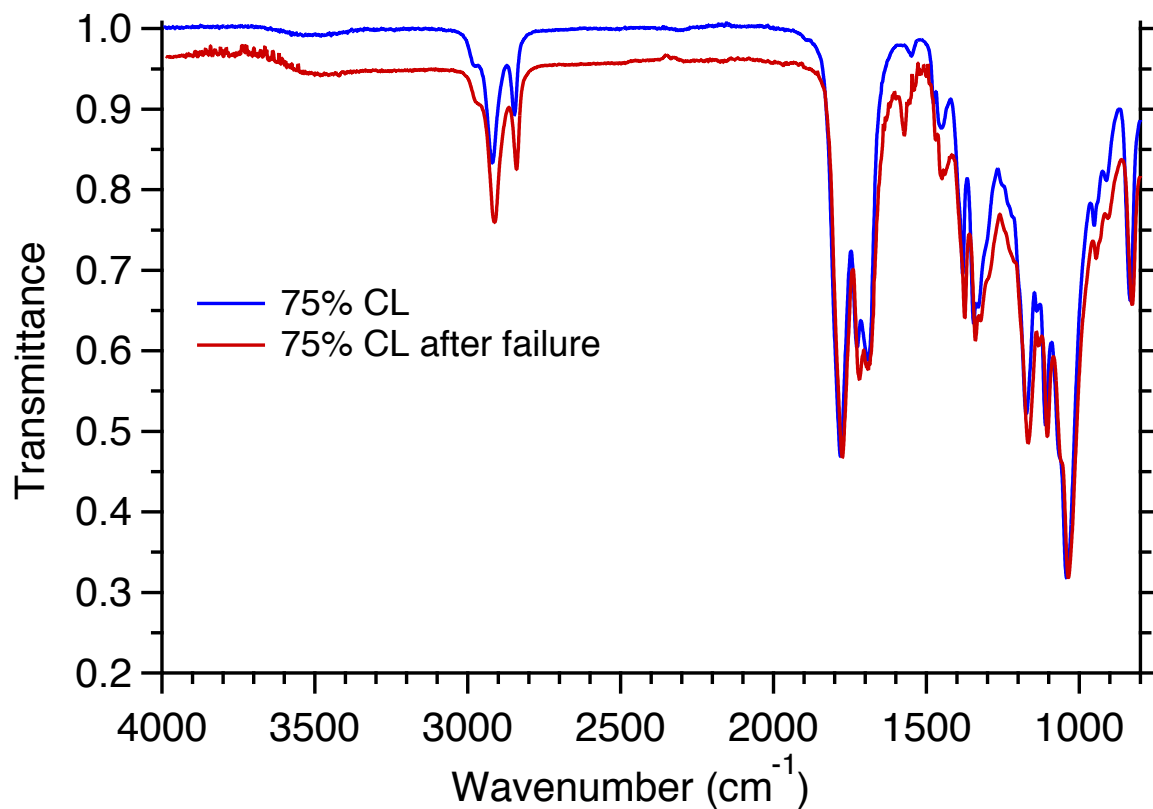
**Figure S1.**  $^1\text{H}$  NMR spectrum (300 MHz,  $\text{DMSO-}d_6$ , 22°C) of lithium bis(non-8-enyl-malonato) borate (LiBNMB).



**Figure S2.** FTIR spectra of the trithiol TMPT in propylene carbonate at various concentrations, demonstrating the intensity of the thiol S-H peak at 2570 cm<sup>-1</sup>.



**Figure S3.** Isothermal frequency sweep for **100CL** at 40 °C before (*orange*) and after (*blue*) dynamic temperature ramp test between  $T = 40\text{--}130$  °C, indicating that the modulus of the material increases upon thermal cycling likely due to solvent evaporation during the test.



**Figure S4.** Representative FTIR spectral overlay of the **75CL** before (*blue*) and after (*red*) failure due to thermal expansion within the confinement of the hermetically sealed conductive cell, which indicates no appreciable changes in the spectra. Thus, the thiol-ene reaction does not revert upon heating.