Supplementary Information

Deformable and Highly Adhesive Poly(ionic liquid)/Liquid Metal Visco-Elastomers for Thermal Management

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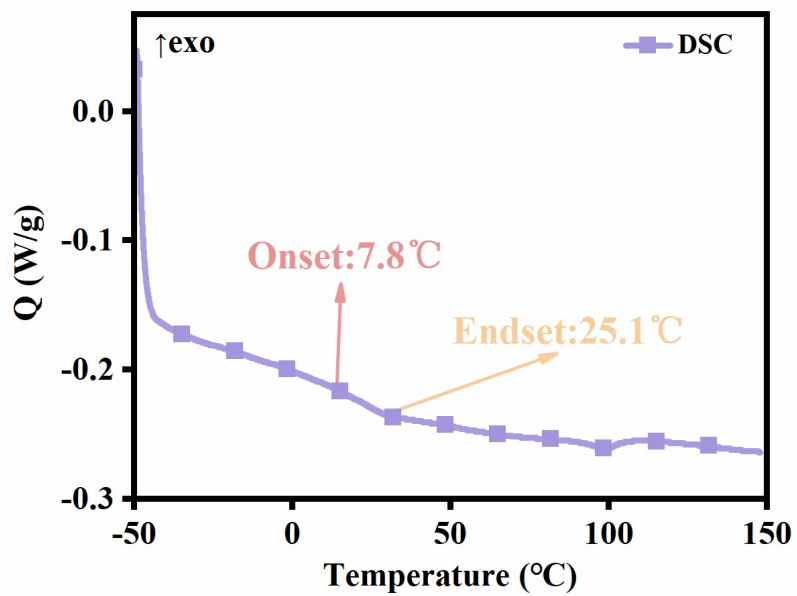*Corresponding author: meng.han@siat.ac.cn, ym.yao@siat.ac.cn

Fig. S1 DSC curve of P[OVIm]NTf$_2$ bulk material in the temperature range of -50 to 150 ℃.
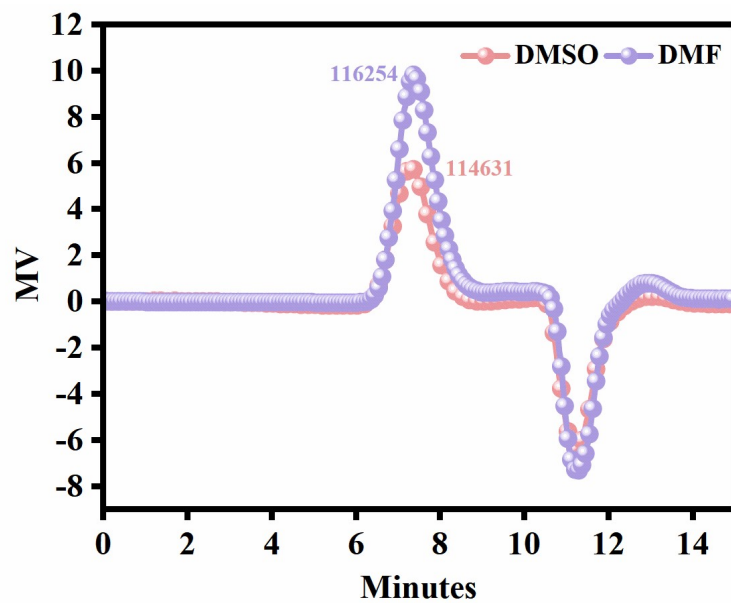
Fig. S2 GPC curves of P[OVIm]NTf$_2$ in two solvents, DMF and DMSO.
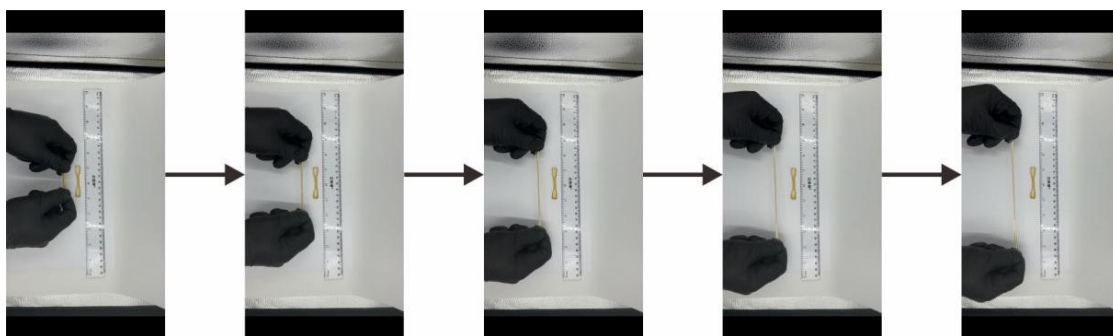
Fig. S3 Demonstration of the stretching process of P[OVIm]NTf$_2$ visco-elastomers.
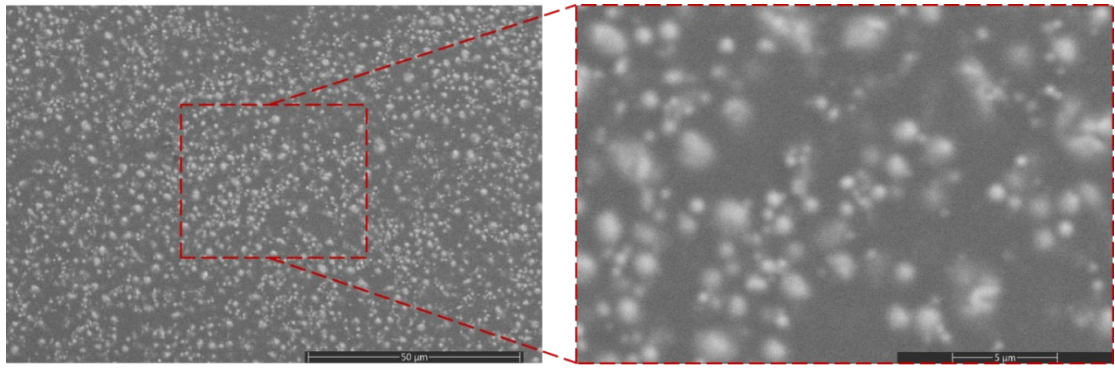
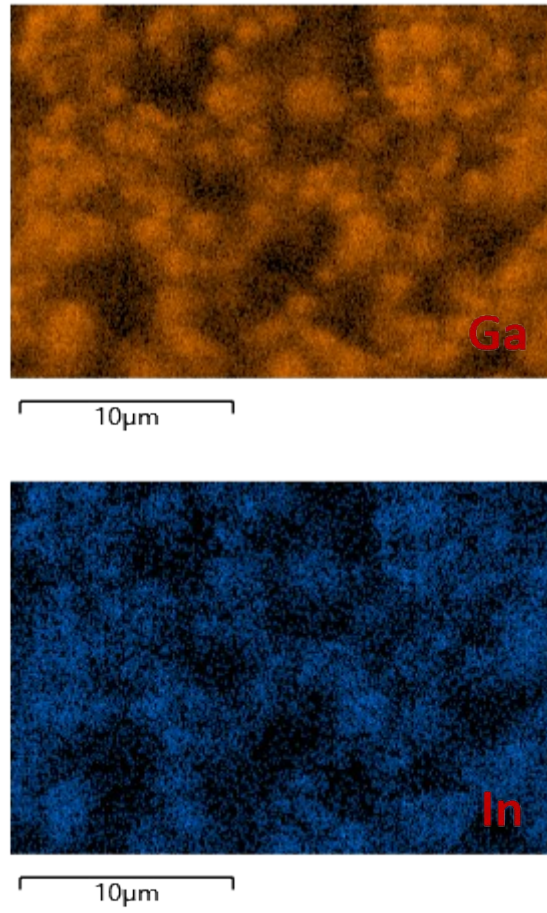**Fig. S4** SEM image of P[OVIm]NTf$_2$/LM (39 vol%) visco-elastomers.

Fig. S5 Elemental distribution mapping of P[OVIm]NTf$_2$/LM (39 vol%) visco-elastomers.
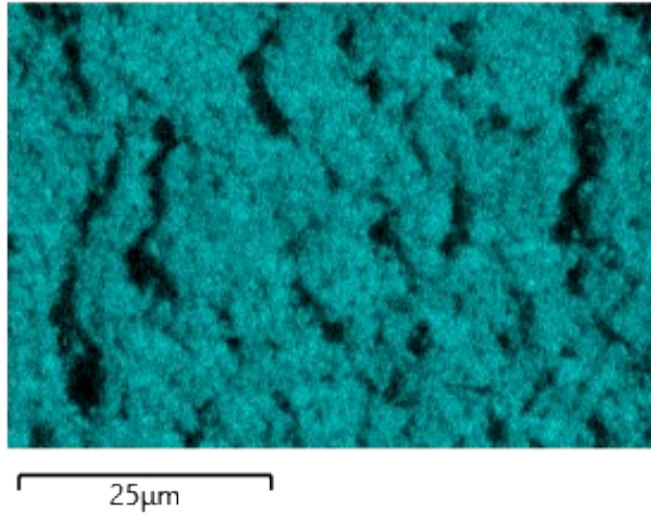
Fig. S6 Elemental distribution mapping of P[OVIm]NTf$_2$/LM (66 vol%) visco-elastomers.

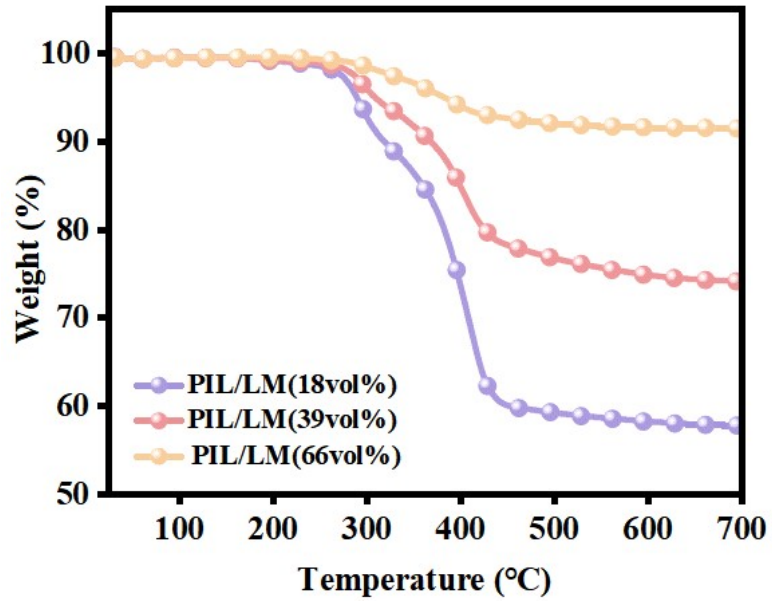**Fig. S7** A comparison of thermal decomposition curves for three proportions under a nitrogen atmosphere, within a temperature range of 20-700 ℃.
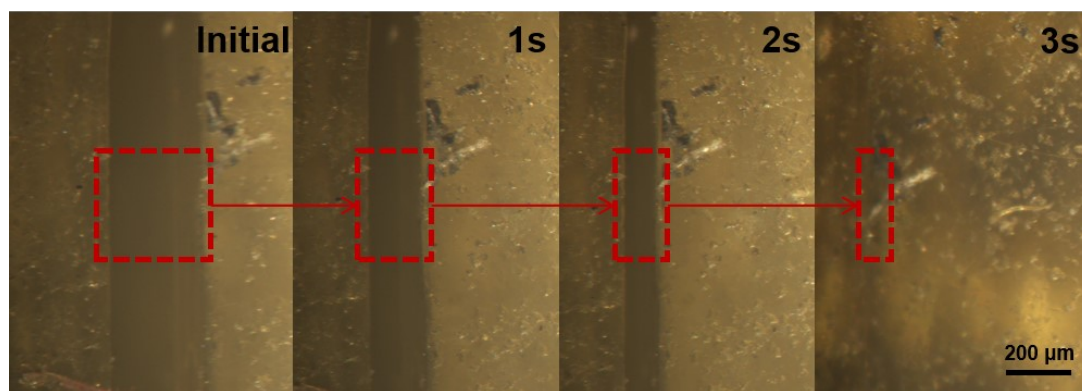
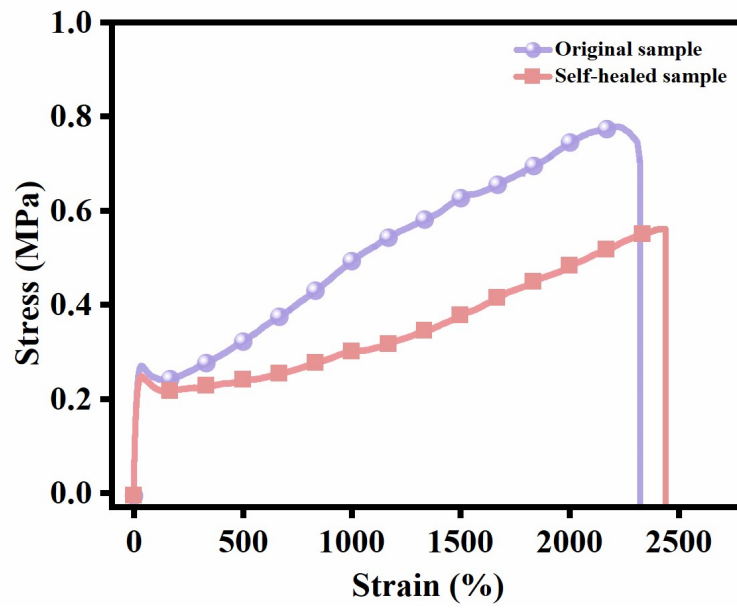**Fig. S8** Optical microscopy images of the P[OVIm]NTf$_2$ self-healing process.

Fig. S9 The mechanical tensile properties of P[OVIm]NTf$_2$ before and after self-healing.
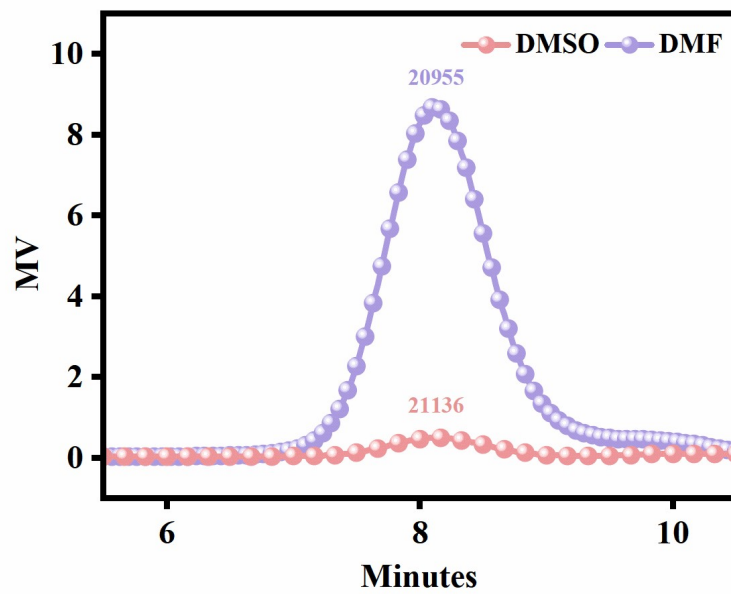
Fig. S10 GPC curves of low MW P[OVIm]NTf$_2$ in two solvents, DMF and DMSO.
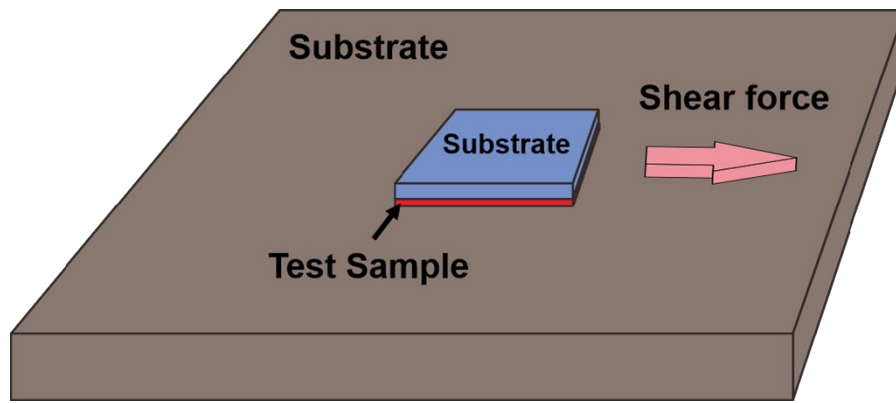
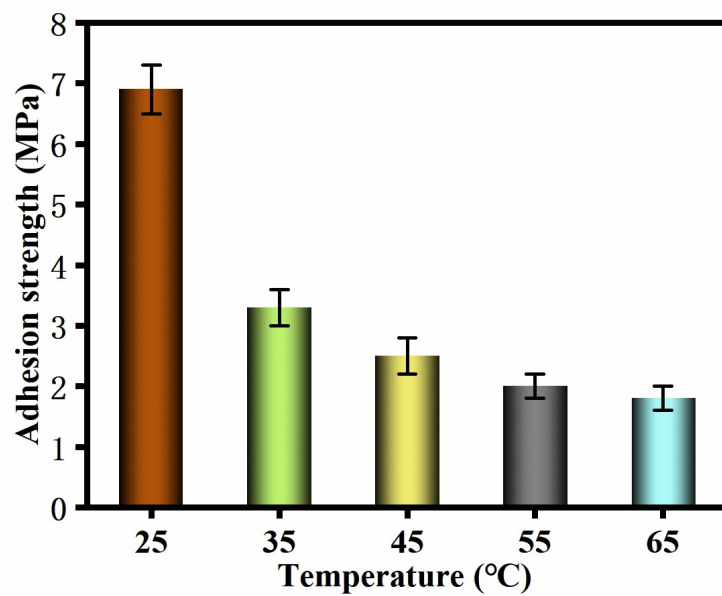**Fig. S11** Diagram of Test Method for Interface Adhesion Performance.

Fig. S12 Interface adhesion strength test at different temperatures for P[OVIm]NTf$_2$.