Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Transparent Flexible Lithium Ion Conducting Solid Polymer Electrolyte

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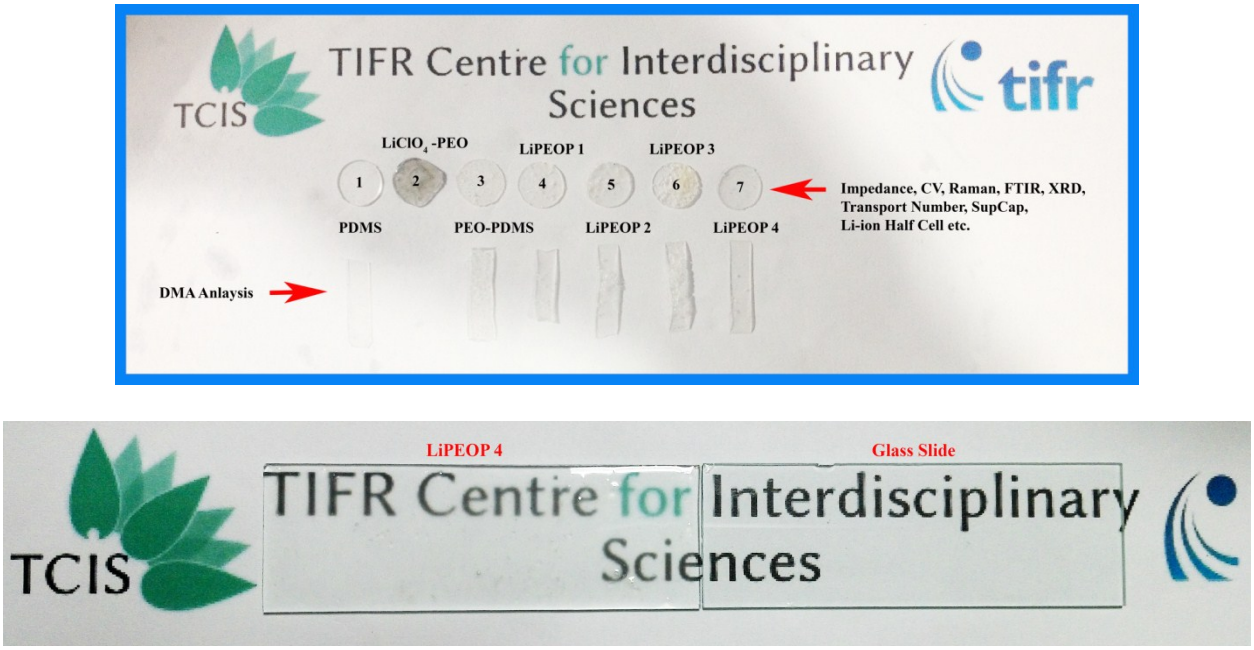

Figure S1. Snaps of the samples used for various measurements.

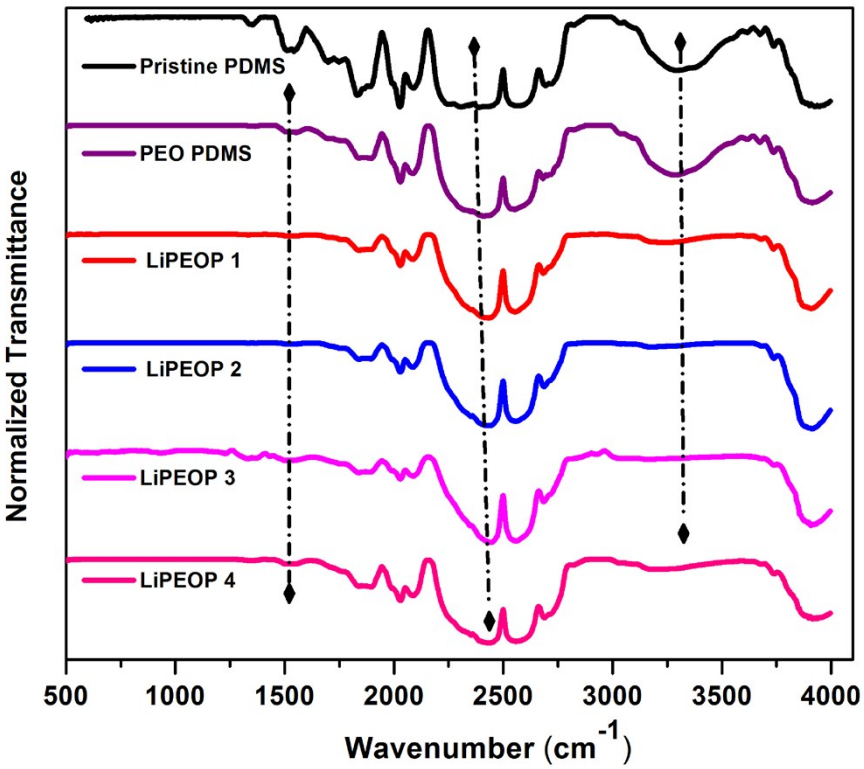

Figure S2. FTIR spectra of various samples.

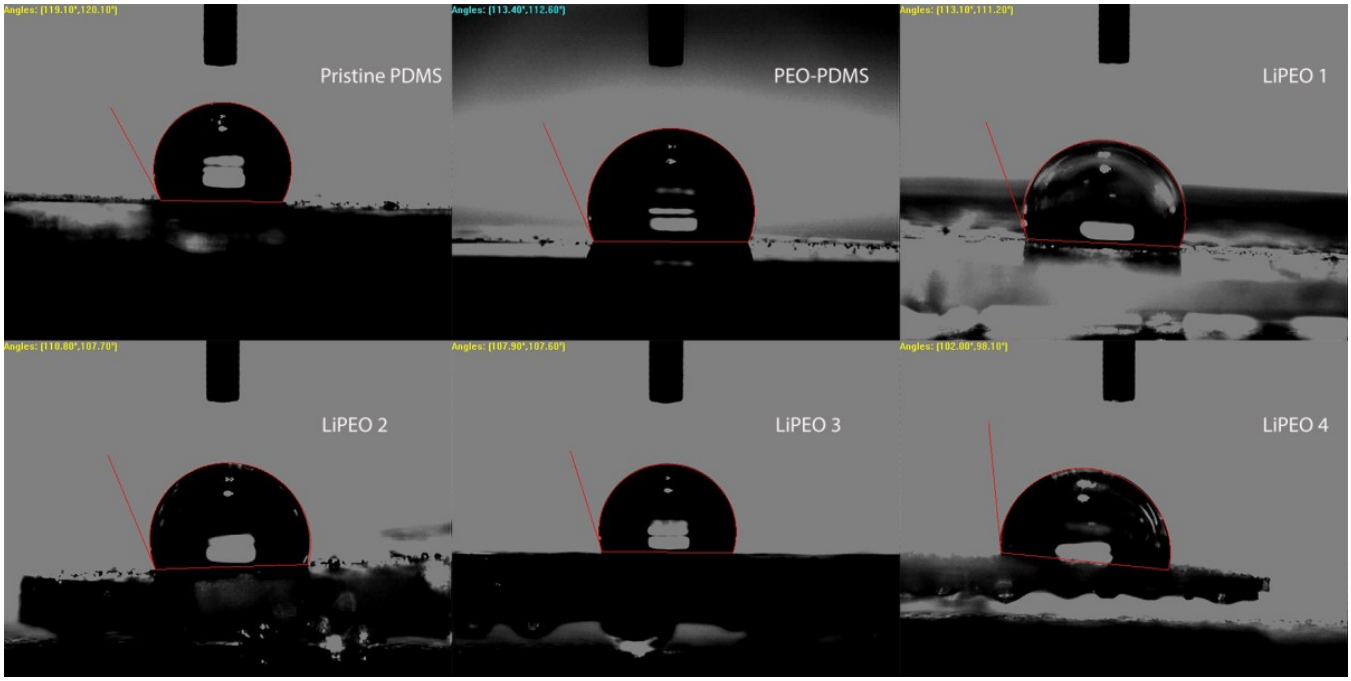

Figure S3. Water contact angles of various samples.

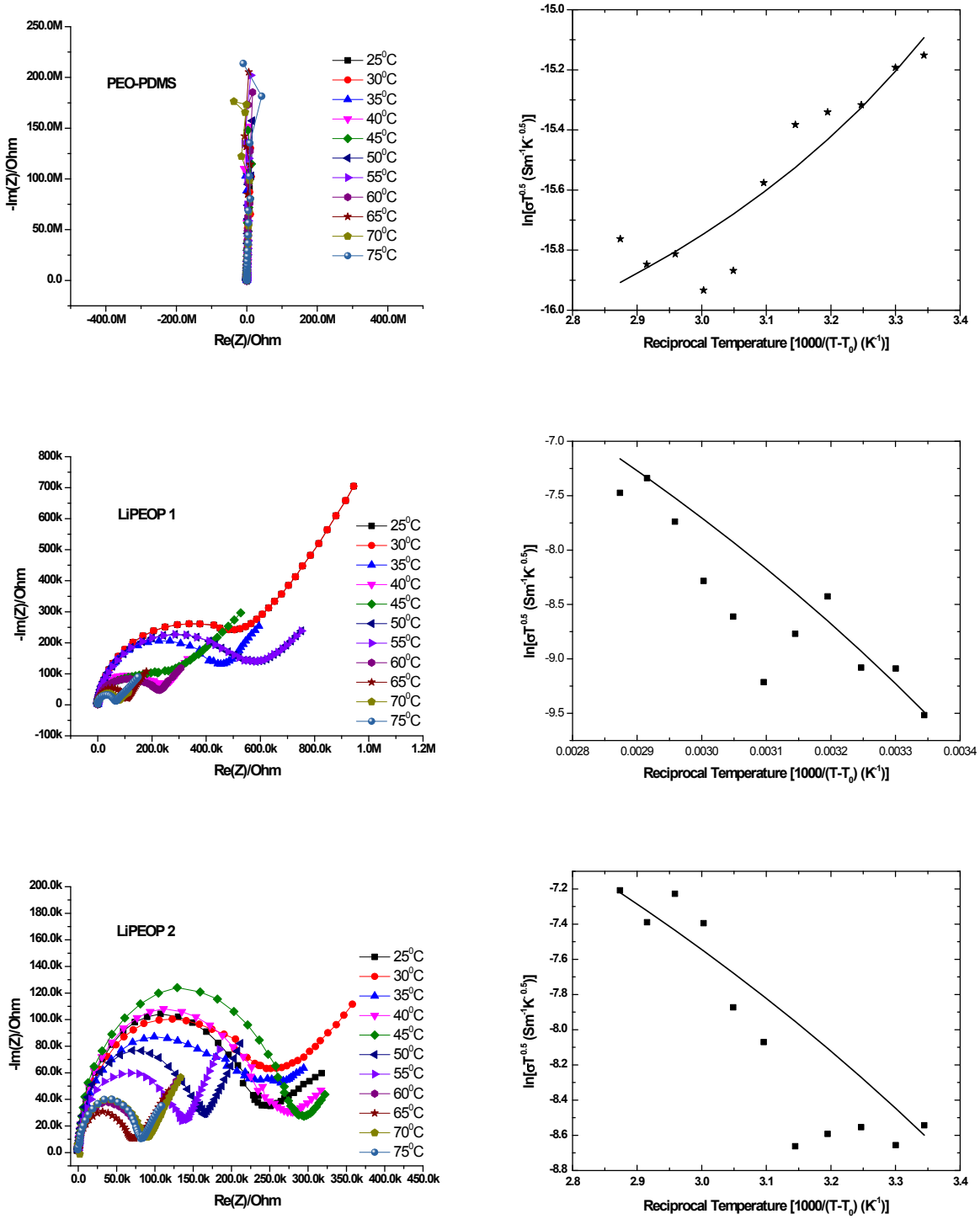

Figure S4. Temperature Dependent Nyquist's Plots and VTF Plots of PEO-PDMS, LiPEOP 1and 2

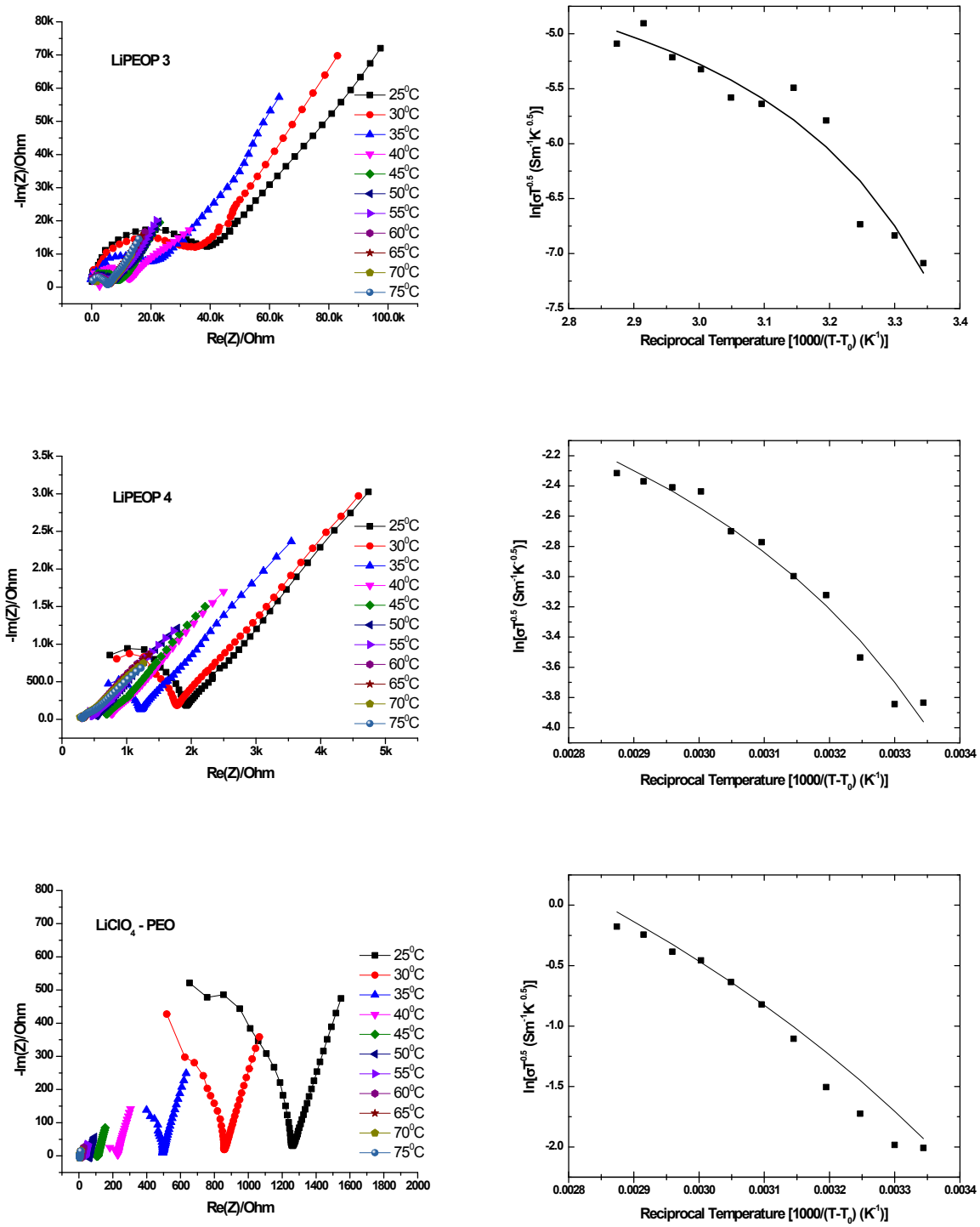

Figure S5. Temperature Dependent Nyquist's Plots and VTF Plots of LiPEOP 3 and 4 and $LiClO_4$-PEO

Supercapacitor – Capacitance Calculation

$$C = 2 * \left(\frac{I}{\frac{dv}{dt} \times M} \right)$$

$\frac{dv}{dt}$ = Calculated from the slope of Discharge curve after the IR drop
I = Constant current used for charging and discharging
M= Weight of active electrode material in one of the electrode

Reference:
1. BihagAnothumakkool, Siddheshwar N. Bhange, Sreekuttan M. Unniand Sreekumar Kurungot, 1-Dimensional confinement of porous polyethylenedioxythiophene using carbon nanofibers as a solid template: an efficient charge storage material with improved capacitance retention and cycle stability, *RSC Adv.*, 3, 11877-11887 (2013)

Thickness Dependent Ion conductivity variation – LiPEOP 4

Nyquist Impedance curves of the three samples

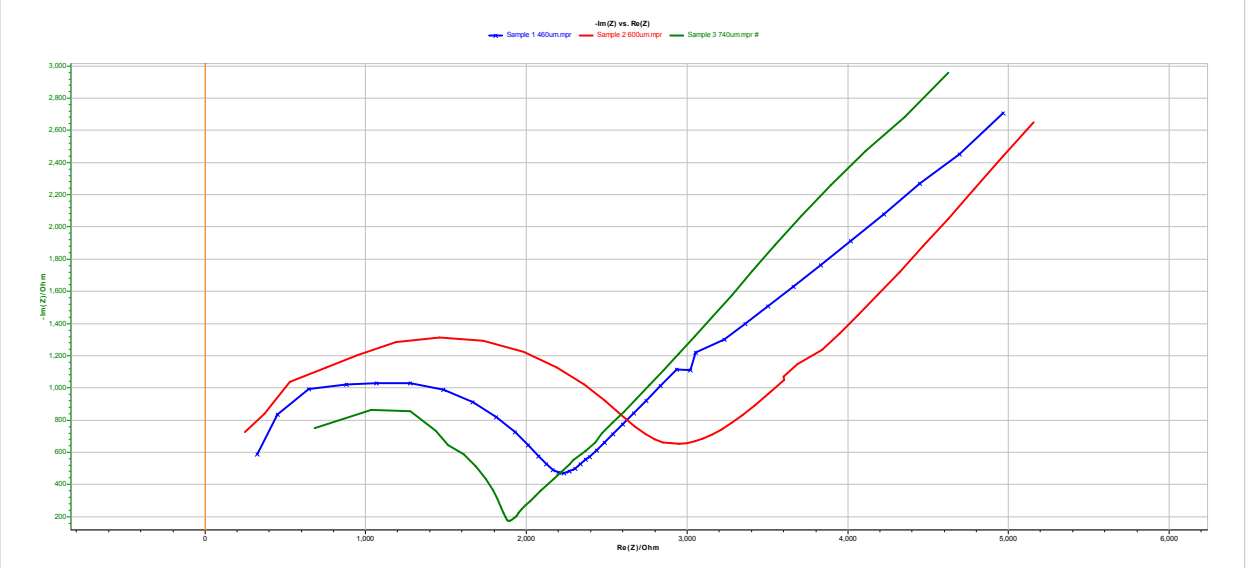

Figure S7: Variation of Conductivity of LiPEOP 4 with thickness – Nyquist Plots

Thickness - l (µm)	Area - A (m^{-2})	Bulk Resistance - R_b (Ω)	Conductivity - σ (S/m)
460	1.13 x 10^{-4}	1909.68	1.57 x 10^{-3}
600	1.13 x 10^{-4}	2699.86	1.55 x 10^{-3}
740	1.13 x 10^{-4}	1550.00	2.98 x 10^{-3}

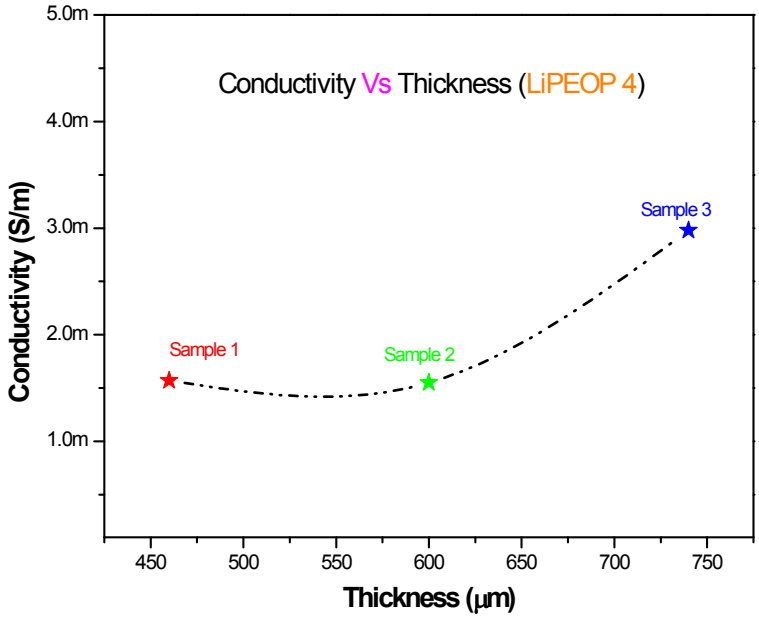

Figure S6: Variation of Conductivity with thickness