

Table 1 Sample designation and mass of the materials used in the present work.

Sample designation	Polymer host (%) = 0.2 g		LiTFSI content (wt.%)
	PMMA	PLA	
PMMA-PLA			0
LiTFSI 5			5
LiTFSI 10			10
LiTFSI 15	80 %	20 %	15
LiTFSI 20			20
LiTFSI 25			25
LiTFSI 30			30
LiTFSI 35			35

Table 2 Glass transition temperature of HGPEs at selected samples.

Samples	Glass transition, T_g (°C)
LiTFSi 5	102.8
LiTFSI 10	90.1
LiTFSI 20	85.4
LiTFSI 30	132.3

Table 3 the parameter for PMMA-PLA-LiTFSI based HGPEs.

Electrolyte	R_b experimental (Ω)	R_b fitting (Ω)	p_1	k_1 (F^{-1})	p_2	k_2 (F^{-1})
LiTFSI 5	5.01×10^2	5.03×10^2	0.1	1.00×10^5	0.76	5.57×10^4
LiTFSI 10	1.81×10^2	1.78×10^2	-	-	0.82	3.03×10^4
LiTFSI 15	1.58×10^2	1.53×10^2	-	-	0.76	2.56×10^4
LiTFSI 20	9.99×10^1	9.79×10^1	-	-	0.82	3.72×10^4
LiTFSI 25	1.29×10^2	1.27×10^2	-	-	0.82	3.92×10^4
LiTFSI 30	1.77×10^2	1.77×10^2	-	-	0.84	5.55×10^4
LiTFSI 35	1.89×10^2	1.87×10^2	-	-	0.835	5.26×10^4

Table 4. Ionic conductivity studies based gel polymer electrolytes.

Polymer electrolyte	Ionic conductivity (S cm ⁻¹)	Reference
PVAc/PMMA/LiClO ₄ /PC	4.51 x 10 ⁻⁴	[48]
PAN/EC/PC/LiTFSI	2.50 x 10 ⁻³	[64]
PMMA/EC/PC/LiBF ₄	2.24 x 10 ⁻³	[65]
PMMA/LiCF ₃ SO ₃	9.88 x 10 ⁻⁵	[66]
PVDF-HFP/PMMA/LiClO ₄	2.83 x 10 ⁻⁴	[67]
PMMA/PLA/LiTFSI	1.02 x 10 ⁻³	Present work