Data used to calculate the number densities of PEMA/PVdF–HFP–LiTf –EC system

The density for PEMA, PVdF–HFP, LiTf and EC = 1.11, 1.78, 1.90 and 1.32 g cm^{-1} respectively. The density for PEMA/PVdF–HFP (70:30) is taken to be 1.311 g cm^{-1}. The molecular weight of LiTf is 156.01 g mol^{-1}. The number of mole of LiTf in this system is calculated using the fixed amount of salt present in the composition of the optimized 70 wt.% PEMA/PVdF–HFP– 30 wt.% LiTf sample. The number density, *n* of the total number of free ions is obtained by multiplying the number density calculated for Tf^- ions by a factor of two. This is because the amount of Li^+ ions equal to the amount of Tf^- ions present in each sample. Table below lists the parameters used to calculate the number densities of Li^+ and Tf^- ions.

Sample	No. of mole of LiTf	FI (%)	σ (S cm^{-1})	$V_{PEMA/PVdF-HFP\ (70:30)}$ (cm^3)	V_{LiTf} (cm^3)	V_{EC} (cm^3)	V_{Total} (cm^3)	*n* of free Tf^- ions (cm^{-3})	*n* of free Li^+ and Tf^- ions (cm^{-3})
EC–2	2.75×10^{-3}	51.10	3.53×10^{-5}	1.311	0.814	0.039	2.16	3.91×10^{22}	7.81×10^{22}
EC–4	2.75×10^{-3}	38.39	4.77×10^{-5}	1.311	0.814	0.079	2.20	2.88×10^{22}	5.76×10^{22}
EC–6	2.75×10^{-3}	26.51	1.05×10^{-4}	1.311	0.814	0.120	2.25	1.95×10^{22}	3.91×10^{22}
EC–8	2.75×10^{-3}	33.77	3.80×10^{-5}	1.311	0.814	0.164	2.29	2.44×10^{22}	4.88×10^{22}
EC–10	2.75×10^{-3}	42.07	1.20×10^{-5}	1.311	0.814	0.210	2.33	2.98×10^{22}	5.96×10^{22}