

Supplementary Data

Title: Li ion / vapor grown carbon fiber polymer actuator with higher performance than single-walled carbon nanotube polymer actuator

Authors: Naohiro Terasawa,^{*} Ichiroh Takeuchi

Affiliation:

Health Research Institute, National Institute of Advanced Industrial Science and Technology

(AIST), 1-8-31 Midorigaoka, Ikeda, Osaka 563-8577, Japan

Tel: +81-72-751-7914, Fax: +81-72-751-8370

E-mail: terasawa-naohiro@aist.go.jp

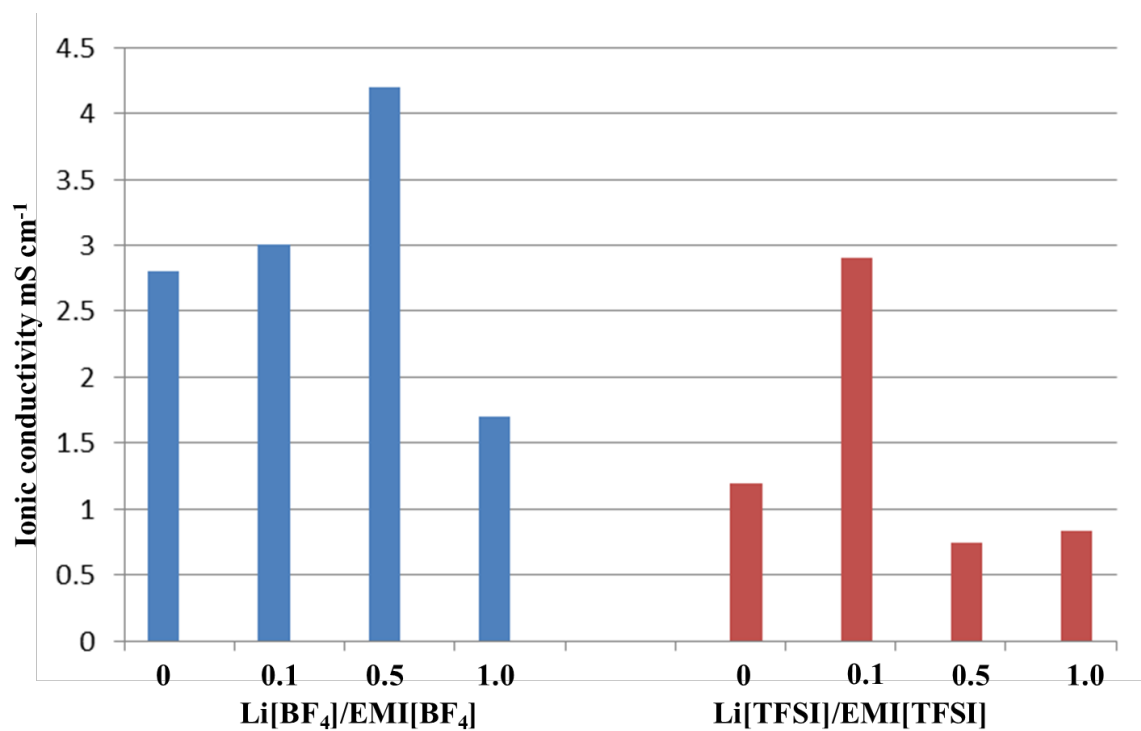


Fig. S1 Ionic conductivities of gel electrolyte layers with different Li[BF₄]/EMI[BF₄] and Li[TFSI]/EMI[TFSI] molar ratios.

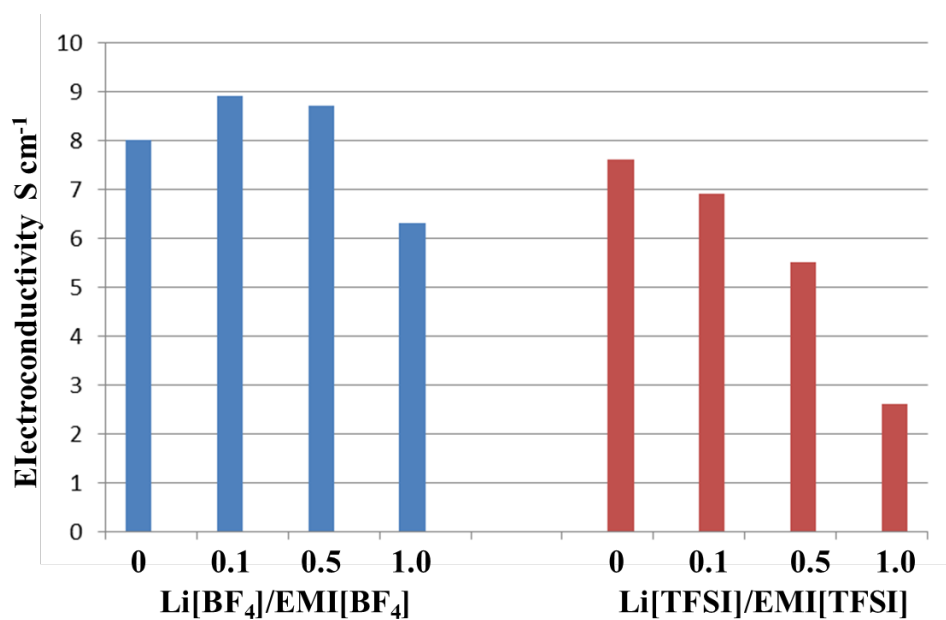


Fig. S2 Electrical conductivity (S·cm⁻¹) for polymer-supported electrode layers with different Li[BF₄]/EMI[BF₄] and Li[TFSI]/EMI[TFSI] molar ratios.

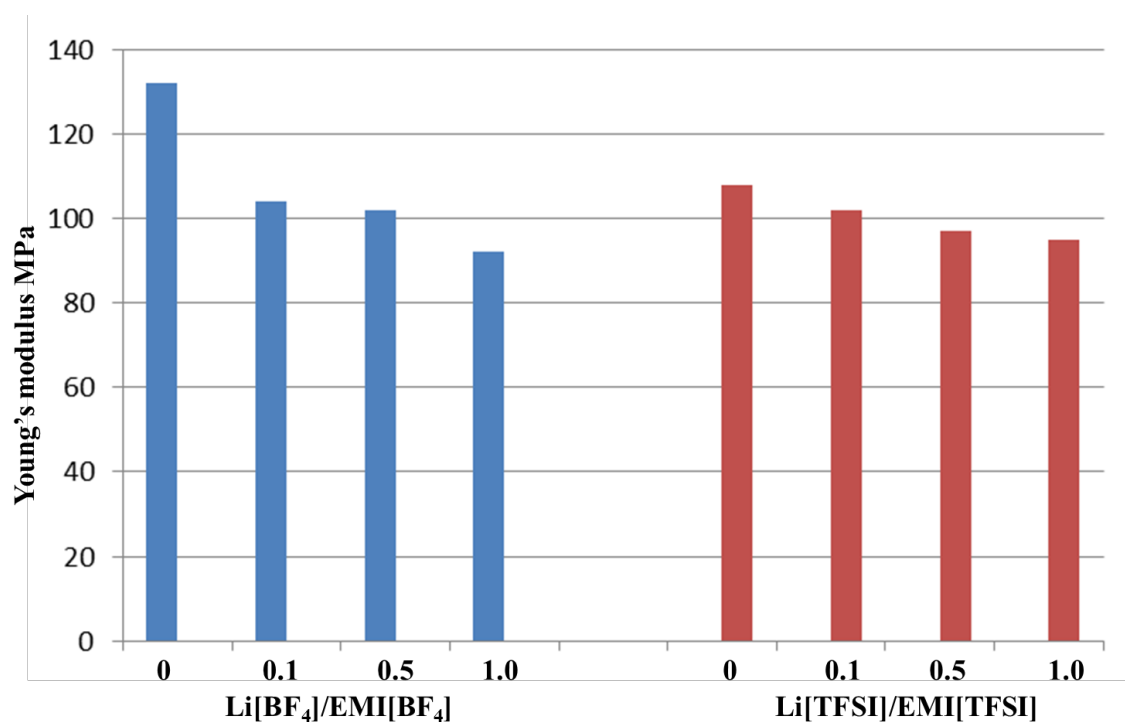


Fig. S3 Young's modulus (MPa) for electrode layers with different Li[BF₄]/EMI[BF₄] and Li[TFSI]/EMI[TFSI] molar ratios.

Table S1 Simulation parameters.

Li[X]/ EMI[X] = 1	C (F g ⁻¹)	C (F cm ⁻²)	κ (mS cm ⁻¹)	R (Ω cm ²)	ε_0 (%)	CR (s)
[BF ₄]	42.2	0.0237	2.8	0.714	0.37	0.0169
[TFSI]	20.9	0.0102	1.2	1.669	0.38	0.0170

Table S2 Simulation parameters considering electrode resistance.

Li[X]/ EMI[X] = 1	<i>C</i> (F cm⁻²)	<i>R_{el}</i> (Ω cm²)	<i>R+R_{el}</i> (Ω cm²)	<i>C(R+R_{el})</i> (s)
[BF₄]	0.0237	20.08	20.79	0.493
[TFSI]	0.0102	64.10	65.77	0.671