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[Supporting Information]

Strategies for Fast Ion Transport in Electrochemical Capacitor Electrolytes from Diffusion Coefficients, Ionic Conductivity, Viscosity, Density and Interaction Energies Based on HSAB Theory

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Table S1. Self-diffusion coefficients D of ions and PC solvent and transference number of cations t_{cation} at each measured temperature

Electrolyte		Self-diffusion coefficient / 10^{-10} m^2 s^{-1}			Transference number of cation
		D_{PC}	D_{cation}	D_{anion}	t_{cation}
1.0 M $TEABF_4$/PC	353 K	9.2	6.5	9.5	0.41
	333 K	6.5	4.4	6.7	0.40
	303 K	3.7	2.5	3.5	0.42
	283 K	1.7	1.1	1.6	0.41
	253 K	0.79	0.61	0.73	0.46
1.0 M $TEAPF_6$/PC	353 K	10	7.3	$11._5$	0.39
	333 K	6.8	4.5	6.2	0.42
	303 K	3.4	2.2	2.7	0.45
	273 K	1. 6	0.97	1.2	0.45
	253 K	0.73	0.45	0.52	0.46
1.0 M TEATfO/PC	353 K	12	7.6	$10._5$	0.42
	303 K	3.3	2.2	2.7	0.45
	273 K	1.6	1.1	1.2	0.47
	253 K	0.75	0.48	0.57	0.46
1.0 M $TEMABF_4$/PC	353 K	19	13	15	0.46
	333 K	9.6	6.9	8.6	0.45
	303 K	3.9	2.6	3.5	0.43
	273 K	1.7	1.1	1.6	0.41
	253 K	0.87	0.55	0.78	0.41
1.0 M $LiBF_4$/PC	353 K	7.8	4.4	5.3	0.45
	333 K	4.8	2.4	3.0	0.44
	303 K	2.4	1.0	1.4	0.42
	273 K	0.97	0.37	0.58	0.41
	253 K	0.39	0.15	0.23	0.39

Table S2. Viscosity η for 1.0 M PC-based electrolytes at each measured temperature

Electrolyte		Viscosity η / mPas	Inverse of viscosity η^{-1} / $mPas^{-1}$
	353 K	1.7	0.60
1.0 M	333 K	2.2	0.46
$TEABF_4$/PC	303 K	3.6	0.27
	283 K	5.9	0.17
	353 K	1.8	0.56
1.0 M	333 K	2.3	0.43
$TEAPF_6$/PC	303 K	4.0	0.25
	283 K	6.7	0.15
	353 K	1.7	0.58
1.0 M	333 K	2.2_5	0.44
TEATfO/PC	303 K	3.8	0.26
	283 K	6.2	0.16
	353 K	1.6	0.61
1.0 M	333 K	2.1	0.47
$TEMABF_4$/PC	303 K	3.6	0.28
	283 K	5.7	0.17
	353 K	2.4	0.42
1.0 M	333 K	3.2	0.31
$LiBF_4$/PC	303 K	6.0	0.17
	283 K	11	0.093