

Supporting Information

Table S1 Solvent content, room-temperature (25 °C) ionic conductivity and safety properties of different electrolyte systems.

	Electrolyte	Ionic conductivity (mS cm ⁻¹)	Solvent content (wt%)	Thermal test	Ref.
Liquid electrolytes	1.2 M LiPF ₆ in 2,2,2-trifluoroethyl acetate (TFEA)	7.20	87.4	Non-flammability/ Overcharge abuse test	1
	1 M LiPF ₆ in dimethyl 2,5- dioxahexanedioate (DMDOHD)	0.21	88.3	Non-flammability	2
	1 M LiPF ₆ in EC/PC/DEC/EMC/cosolvent (2:1:1.5:4:1.5 vol.)	1.46	87.6~ 88.3	ARC	3
	1 M LiFSI in bis(2- methoxyethoxy)methane (BME)	2.15	84.2	Puncture abuse test/ ARC	4
	2 M LiBF ₄ in FEC: DOL=1:9 (volume ratio)	1.76	60.0	-	5
Gel electrolytes	1 M LiPF ₆ , 2.5 wt% MBA, 2.5 wt% TFEA, and 0.075 wt% AIBN in EC/DEC/DMC=1:1:1	2.6	81.0	-	6
	1.5 wt% AFBNNS in ILE: PVDF- HFP:TMPTA with 7:2:1 (mass ratio)	0.65	57.5	-	7
	17 wt% PVDF in LiTFSI: DMIm=1:10 (molar ratio)	1.67	63.9	-	8
	1 M LiPF ₆ , 7.5 wt% TAEP and 2.5 wt% PEGDMA in EC/DEC=1:1 (volume ratio)	0.50	75.1	Overheating abuse test	9

Lean-solvent electrolytes	1 M LiPF ₆ , 2% LiDFOB, 2% TMSP, 0.1% LiNO ₃ and 3% MBA in FEC: HFE: DME=3:5:2 (mass ratio)	1.77	79.2	Non-flammability/ Puncture abuse test	10
	1 M LiTFSI in DEE: SFE=1:2 by volume with 5 wt% BCPN, 1.5 wt% PETEA, 0.1 wt% HMPP	1.007	76.1	Non-flammability/ Overcharge/ Puncture abuse test	11
	0.5 M LiTFSI and 5 wt% PBMA in [EMIM][TFSI]	1.11	87.1	Non-flammability	12
	0.68 M LiTFSI and 0.68 M LiDFOB in PEE: DOL: FEC=1:1:20.2	2.36	75.7	Non-flammability/ Mechanical abuse test	13
	1 M LiPF ₆ in EC/EMC=1:2 (volume ratio), with 2 wt% F7-PVA-CN	7.20	86.1	Non-flammability/ Puncture abuse test	14
	1 M LiPF ₆ in EC/DMC=1:1 (volume ratio), with 3 wt% PMHA	1.83	85.4	-	15
	1 wt% ZSM-5 and 2 wt% nano-SiO ₂ in PVDF-HFP	5.10	80.6	-	16
	PVDF/LiFSI (3/2 weight ratio) with MoSe ₂ nanosheets	0.65	12.3	-	17
	PVHF-HFP/LiTFSI with FDMA (1:1 weight ratio)	0.52	14	Non-flammability	18
	P(VDF-TrFE-CTFE)/Pyr13TFSI/LiFSI (4: 4: 3 weight ratio) with DMF	0.63	14.3	Non-flammability	19
	5 wt% PTFEP in PVDF-HFP with 63 wt% LiFSI	0.3	16.0	Heat treatment	20

	Ni(DMF) ₂ Ni[CN] ₄ /PVDF-HFP/LiFSI (1: 5: 5) with DMF	0.65	7.5	-	21
	PVDF/LiTFSI/LiDFOB/LiBF ₄ (93: 62: 16: 10) with DMF	2.2	17.0	-	22
	P(VDF-TrFE-CTFE)/LiTFSI (3: 4) with DMF	0.82	14.4	Pouch cell cutting	23
	Li+@PI-TMEFB-COF with 20 wt%	0.45	20.0	-	24
	2 M LiTFSI-DOL solution and 5 mM Al(OTf) ₃ -DME solution (90:10 by vol.%)	5.54	10.0	ARC	25
	PVDF-HFP and LiTFSI (3:2 weight ratio)	0.27	11.4	-	26
	ANP-5 with DMF	0.52	10.0	-	27
Solid electrolytes	LiTFSI in PEO(10:1 by mol) with 80% LIZTO	0.032		-	28
	Li ₃ YCl ₆	0.017		-	29
	PVDF, LiTFSI, and LLZTO (6:2:1 by weight ratio)	0.17	0	-	30
	PEO(2.45g)-LiTFSI(0.8g) mixed solution on the LLZO ceramic fabric	0.09		Non-flammability	31
	PEO and LiTFSI (20: 1 by mol)	0.105		-	32

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