

Supporting Information

Enhanced performance of all-organic sandwich structured dielectrics with linear dielectric and ferroelectric polymer

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Characterization

The morphology of raw sepiolite nanofibers, modified sepiolite nanofibers and nanocomposites were characterized by scanning electron microscopy (SEM, JSM-6390). Differential scanning calorimetry (DSC) traces of the nanocomposites were obtained using a TA Q10 DSC instrument at a heating rates of 10 °C/min during the first heating process. 1D WAXD experiments were performed on a BRUKER AXS D8 advance diffractometer with a 40 kV FL tubes as the X-ray source (Cu Ka) and a LYNXEYE_XE detector. Gold electrodes with a thickness of 100 nm and a diameter of 2 mm were sputtered on two sides of films. The dielectric performance was measured using an Agilent 4294A LCR meter with a frequency range from 1 kHz to 10 MHz at room temperature. The polarization-electric field hysteresis loops of the composites were performed at 10 Hz by a TF analyzer 2000 ferroelectric polarization tester (aixACT, Germany). The energy storage performance was calculated according to the P-E loops (The test voltage range is 0-10kV, the temperature range is 25-125°C).

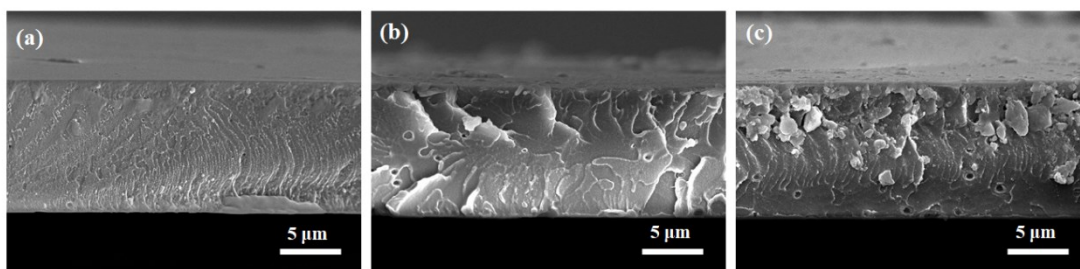


Figure S1 The Cross section SEM image of the (a) 4 vol%, (b) 5 vol% and (c) 6 vol% PVTC/PEI blending films

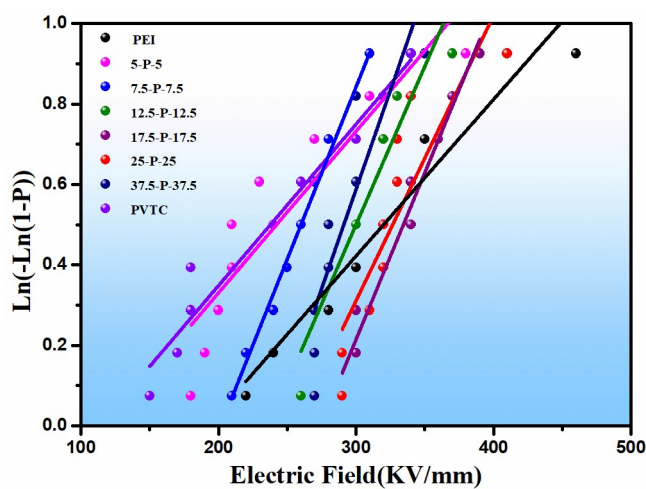


Figure S2. Weibull distribution of reverse-sandwich structured polymer films with different PVTC volume fractions.

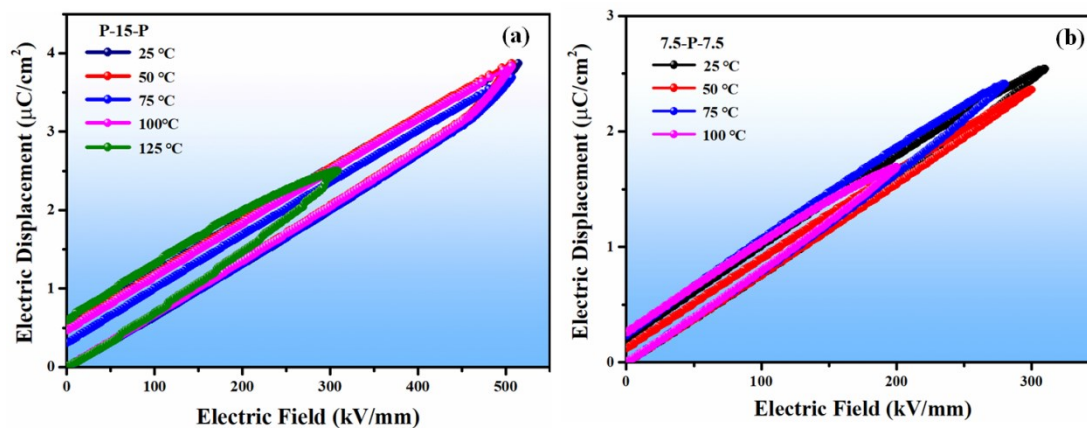


Figure S3. The D-E loops of (a) positive-sandwich structured film P-15-P and (b) reverse-sandwich structured film 7.5-P-7.5 under different temperatures

Table S1. The local electric fields in various layers of positive-sandwich structured films at different electric fields

Sample	200MV/m		300MV/m		400MV/m		500MV/m	
	PEI	PVTC	PEI	PVTC	PEI	PVTC	PEI	PVTC
P-5-P	208	36	313	54	417	72	521	90
P-10-P	218	38	327	57	436	76	545	95
P-15-P	228	40	342	59	455	79	569	99
P-25-P	255	44	383	66	510	88	638	111
P-40-P	301	52	451	78	601	104	751	130
P-60-P	404	70	606	105	808	140	1010	175
P-80-P	598	104	897	155	1195	207	1494	259

Table S2. The local electric fields in various layers of reverse-sandwich structured films at different electric fields

Sample	200MV/m		300MV/m		400MV/m		500MV/m	
	PEI	PVTC	PEI	PVTC	PEI	PVTC	PEI	PVTC
5-P-5	218	38	327	57	436	76	545	95
7.5-P-7.5	228	40	343	59	456	79	571	99
12.5-P-12.5	252	44	378	66	504	87	630	109
17.5-P-17.5	281	49	422	73	563	98	704	121
25-P-25	341	59	511	89	682	118	852	148
37.5-P-37.5	526	91	790	137	1053	182	1316	228