Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Tuning the Interfacial Insulating Shell Characteristics in $CaCu_3Ti_4O_{12}$ Nanowires/Polyetherimide Nanocomposites for High-Temperature Capacitive Energy Storage

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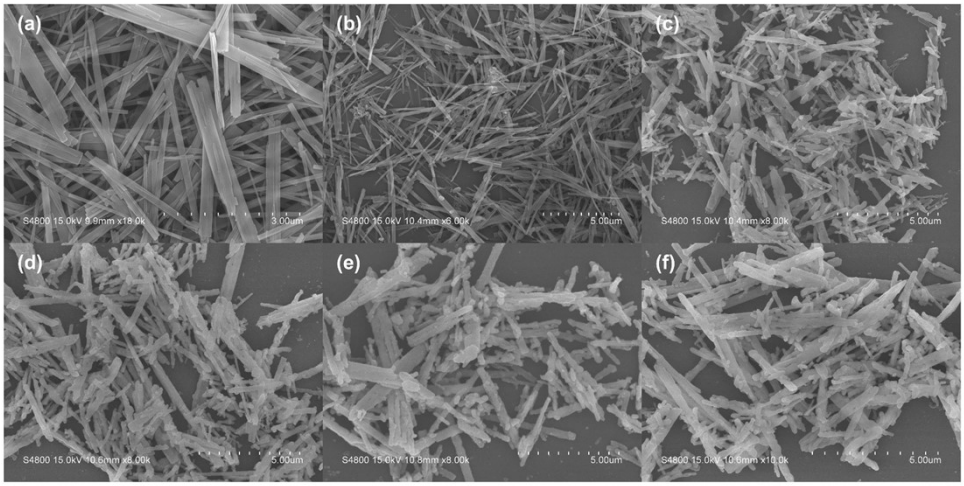

Fig. S1 SEM images of (a) HTO NWs, (b) ion-exchanged HTO NWs, (c) CCTO NWs, (d) SO@CCTO NWs, (e) HO@CCTO NWs, and (f) TO@CCTO NWs.

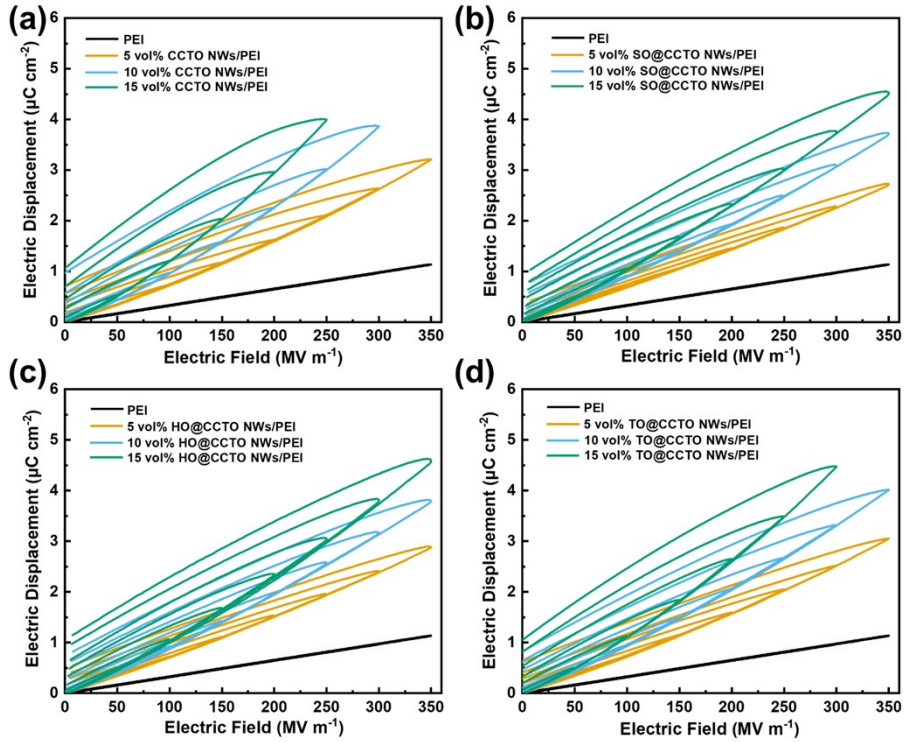

Fig. S2 *D-E* loops of (a) CCTO NWs/PEI, (b) SO@CCTO NWs/PEI, (c) HO@CCTO NWs/PEI, and (d) TO@CCTO NWs/PEI nanocomposite films under different electric field.

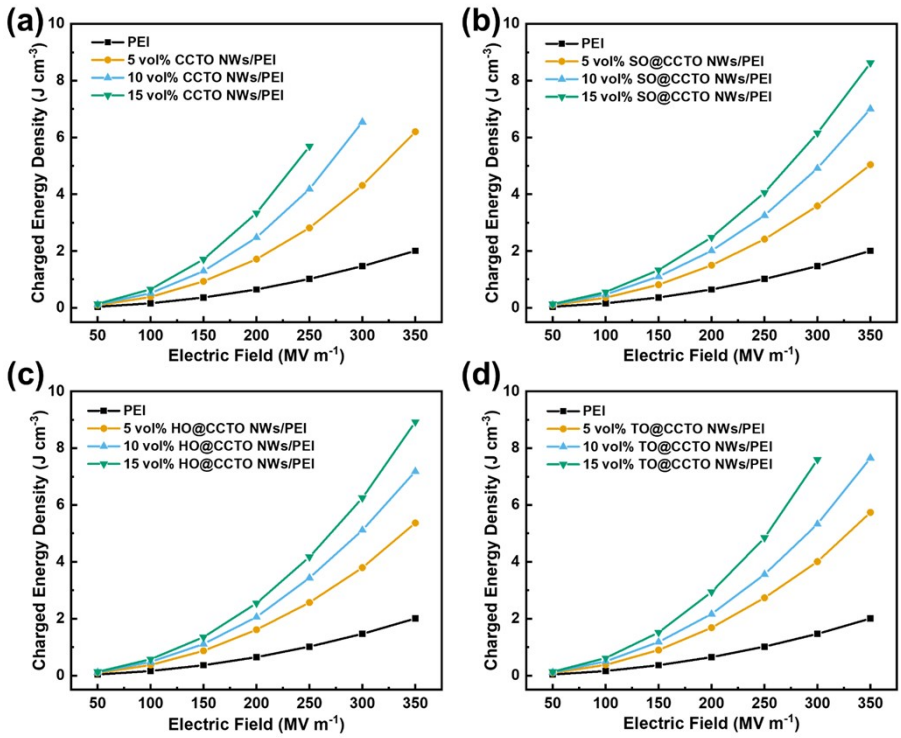

Fig. S3 Charged energy density of (a) CCTO NWs/PEI, (b) SO@CCTO NWs/PEI, (c) HO@CCTO NWs/PEI, and (d) TO@CCTO NWs/PEI nanocomposite films under different electric field.

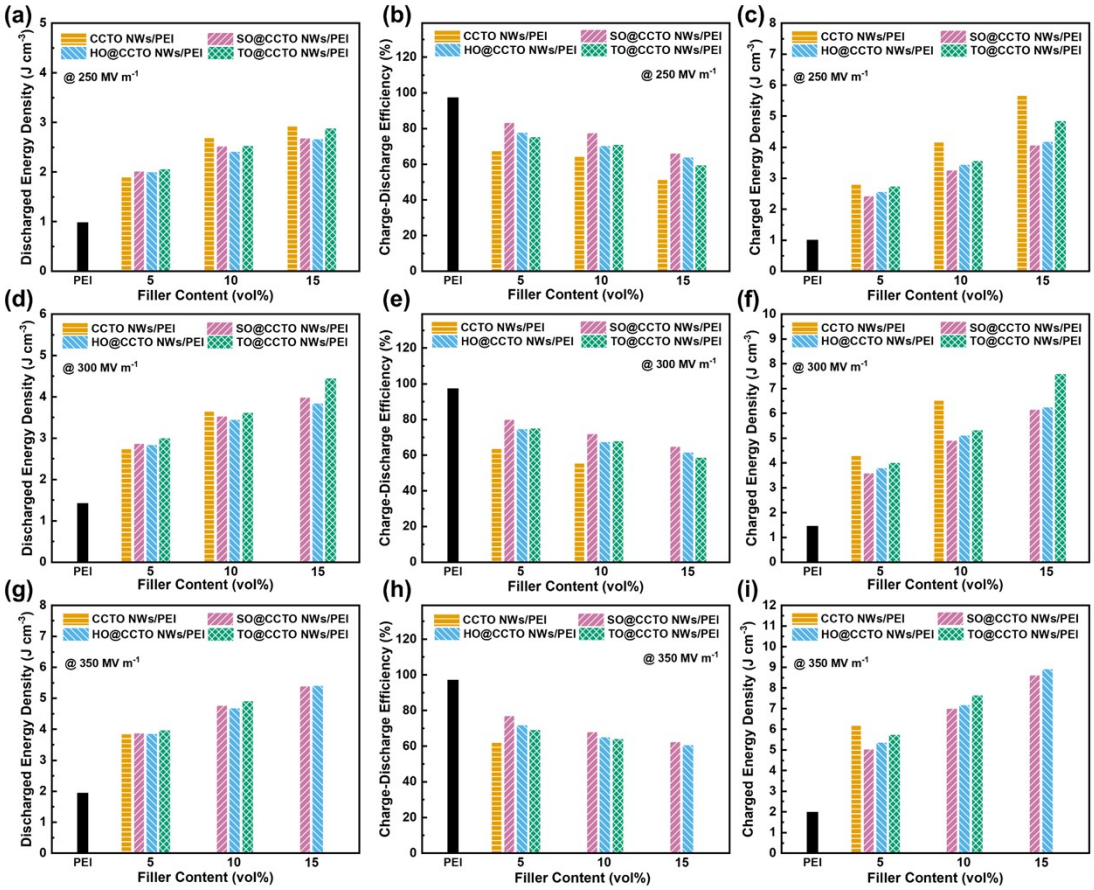

Fig. S4 Comparison of discharged energy density, charge-discharge efficiency, and charged energy density of the four groups of PEI-based nanocomposite films under (a-c) 250 MV m-1, (d-f) 300 MV m-1, and (g-i) 350 MV m-1 electric fields, respectively.

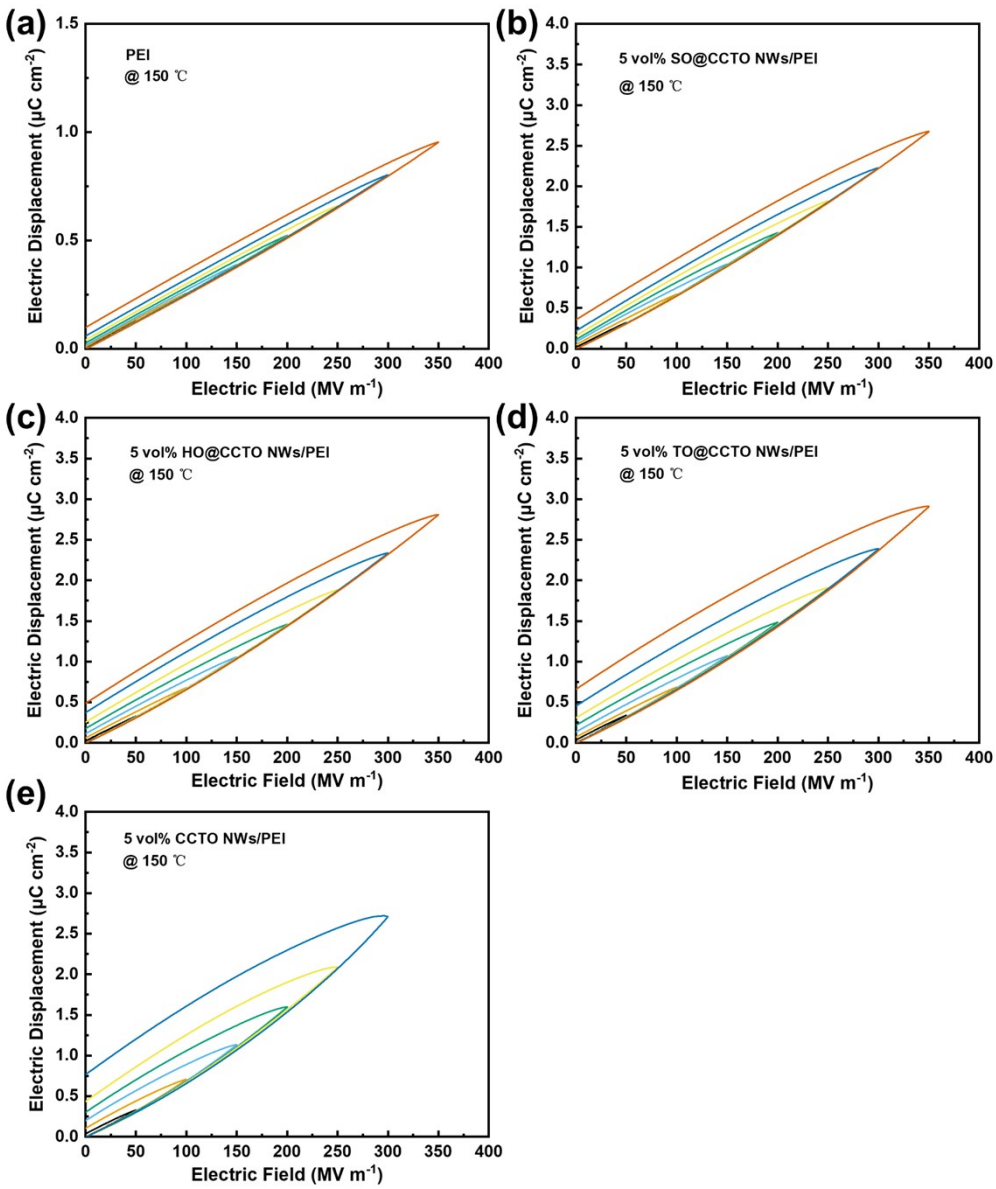

Fig. S5 *D-E* loops of (a) PEI, (b) 5 vol% SO@CCTO NWs/PEI, (c) 5 vol% HO@CCTO NWs/PEI, (d) 5 vol% TO@CCTO NWs/PEI, and (e) 5 vol% CCTO NWs/PEI nanocomposite films at 150 ℃.

Table S1 The dielectric properties of the prepared composites and some reported materials

Matrix	Filler	Dielectric constant at 1 KHz and 25 ℃	Dielectric loss at 1 KHz and 25 ℃	Breakdown strength (MV m^{-1}) at 25 ℃	Discharge energy density (J cm^{-3}) at 250 MV m^{-1} and 150 ℃	Efficiency (%) at 250 MV m^{-1} and 150 ℃	Ref.
PES	10 vol% BT-HCuPc	6	0.04	310	None	None	S1
c-BCB	10 vol% BNNs	3	0.001	450	0.8	95	S2
c-BCB	7.5 vol% Al_2O_3-NPLs	3.5	0.002	500	1.01	96.75	
c-BCB	7.5 vol% Al_2O_3-NWs	3.6	0.0024	None	0.98	88.73	S3
c-BCB	7.5 vol% Al_2O_3-NPs	3.4	0.0025	None	0.89	78.93	
PI	1 vol% BTNFs	3.8	0.025	550	1.5	94	S4
PI	3 vol% BTO	4.1	0.015	275	None	None	S5
PEI	11 vol% ZrO_2	4	0.005	579	1.1	95	S6
PEI	11 vol% Al_2O_3@ZrO_2	3.9	0.004	615	1.1	96	
PEI	5 vol% CCTO NWs	7.9	0.017	406	1.76	60.83	
PEI	5 vol% TO@CCTO NWs	7.5	0.011	434	1.85	72.49	This
PEI	5 vol% HO@CCTO NWs	7	0.01	454	1.9	76.24	work
PEI	5 vol% SO@CCTO NWs	6.2	0.009	476	1.95	81.43	

Reference

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