Electronic Supplementary Information

Significantly Enhanced Dielectric Properties and Energy Storage Density for High-*k* Cyanate Ester Nanocomposites Through Building Good Dispersion of Pristine Carbon Nanotubes in Matrix Based on *in-situ* Noncovalent Interaction with Phenolphthalein Poly(ether sulfone)

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S1. Nyquist plots and simulation results for MWCNT/CE and MWCNT/CE/cPES composites.

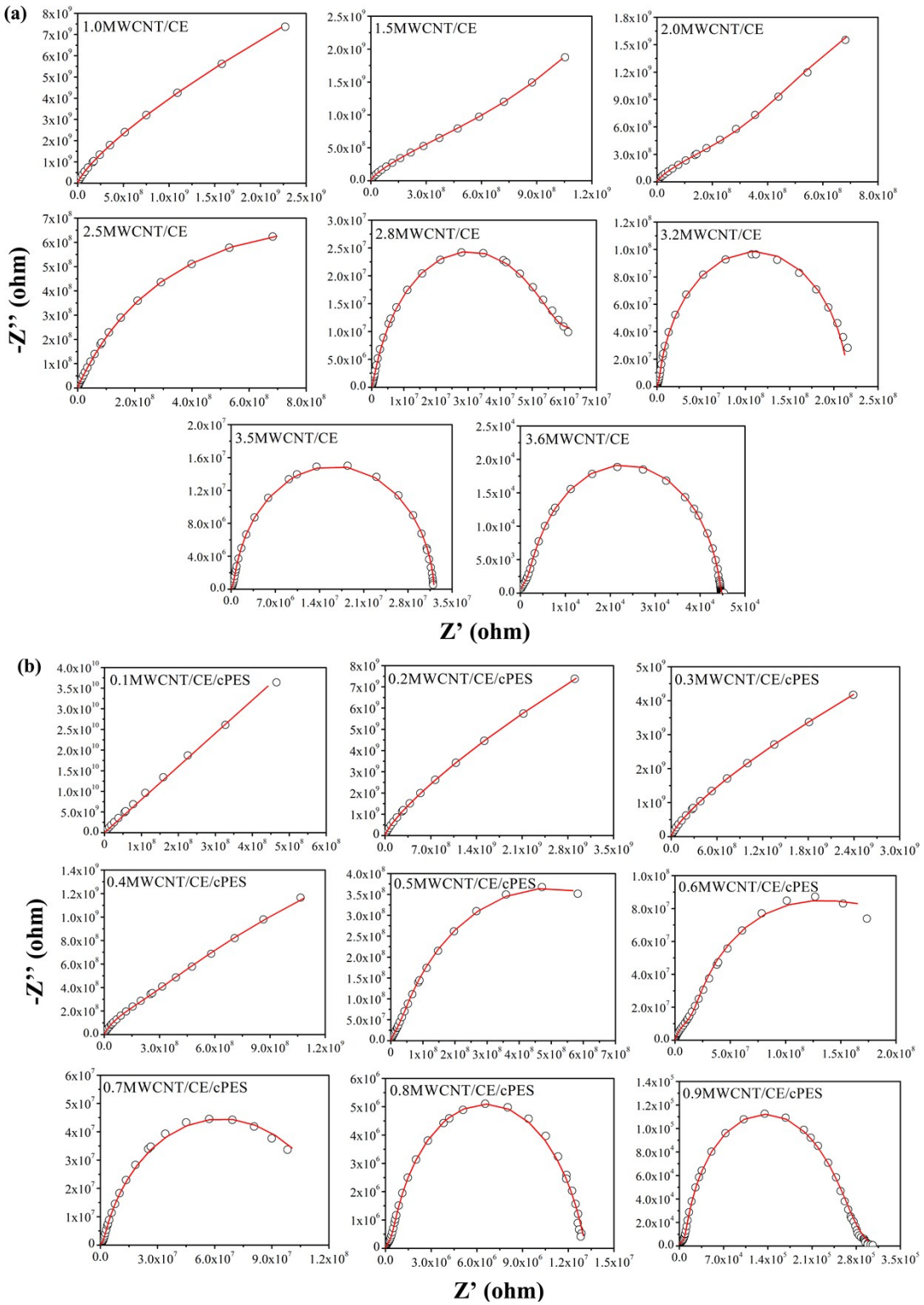

Figure. S1 Nyquist plots of complex impedance planes (hollow circle) and simulation results (solid lines) for MWCNT/CE (a) and MWCNT/CE/cPES (b) composites.

Table S1. Key parameters of high-*k* polymer composites with low dielectric loss. [a)]

Filler [b)]	Filler loading	Polymer matrix [c)]	ε_{fc}	$tan\delta_{fc}$	Reference
EG-MWCNT	0.515 wt%	CE	393	22	[S1]
MWCNTs-OH	0.62 wt%	CE	30	>10	[S2]
MWCNTs	0.5 wt%	CE	306	0.21	[S3]
rGO	0.6 vol%	PVDF	100	2	[S4]
SiO_2 coated rGO	1.49 vol%	P(VDF-CTFE)	25	0.45	[S5]
MWCNTs	2.5 vol%	PVDF	300	11	[S6]
HSiPA coated MWCNTs	1.26 wt%	EP	<100	0.015	[S7]
MWCNTs	25 vol%	PSF	58	0.05	[S8]
PPy coated MWCNTs	10 vol%	PS	44	0.07	[S9]
TiO_2 coated TiB_2	27 wt%	EP	407	1.5	[S10]
MWCNTs, cPES	0.89 wt%	CE	648	4.1	This work

a) The data of high-*k* composites are arranged. Some parameters not reported directly in the references are derived from the corresponding curves. ε_{fc}: dielectric constant at percolation threshold under 100 Hz. $tan\delta_{fc}$: dielectric loss at percolation threshold under 100 Hz.

b) EG: Expanded graphite; MWCNTs: Multi-wall carbon nanotubes; rGO: reduced graphene oxide; HSiPA: Hyperbranched polyaniline; PPy: Polypyrrole; cPES: Phenolphthalein poly(ether sulfone); TiO_2: titanium dioxide; TiB_2: titanium diboride.

c) CE: Cyanate ester resin; PVDF: Poly(vinylidene fluoride); P(VDF-CTFE): Poly(vinylidenefluoride-co-chlorotrifluoroethylene); EP: Epoxy resin; PSF: Polysulfone; PS: Polystyrene; PP: Polypropylene.

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