Electronic Supplementary Material (ESI) for Materials Horizons.

Improved Capacitive Energy Storage Performance in Hybrid Films with Ultralow Aminated Molybdenum Trioxide Integration for High-Temperature Applications

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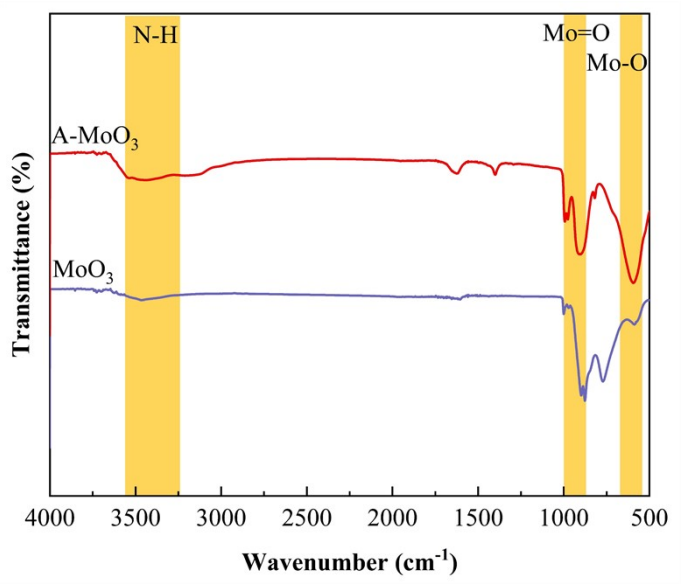

Fig. S1 FTIR spectra of animated MoO_3 nanoparticles

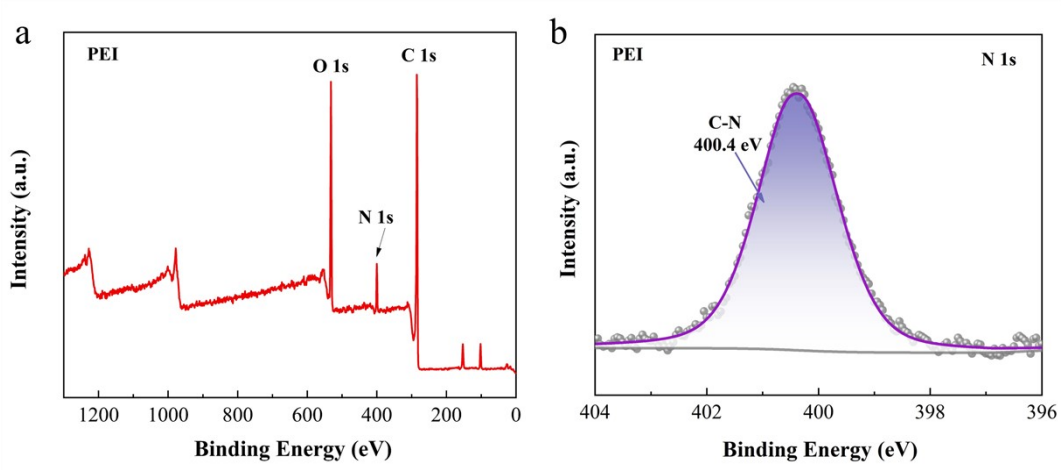

Fig. S2 (a) XPS general spectra of pristine PEI. (b) High-resolution N_{1s} of pristine PEI.

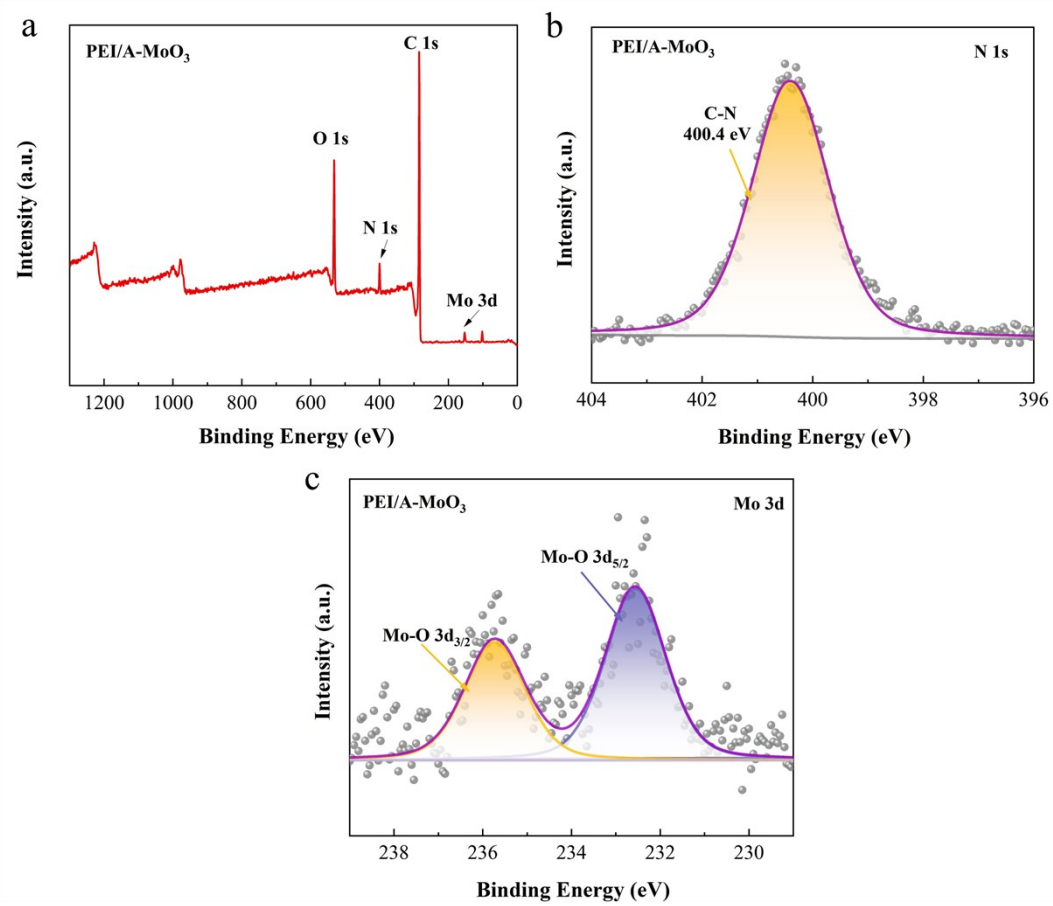

Fig. S3 (a) XPS general spectra of PEI/A-MoO_3 Hybrid film. High-resolution (b) N_{1s} and (c) Mo_{3d} of PEI/A-MoO_3 Hybrid film.

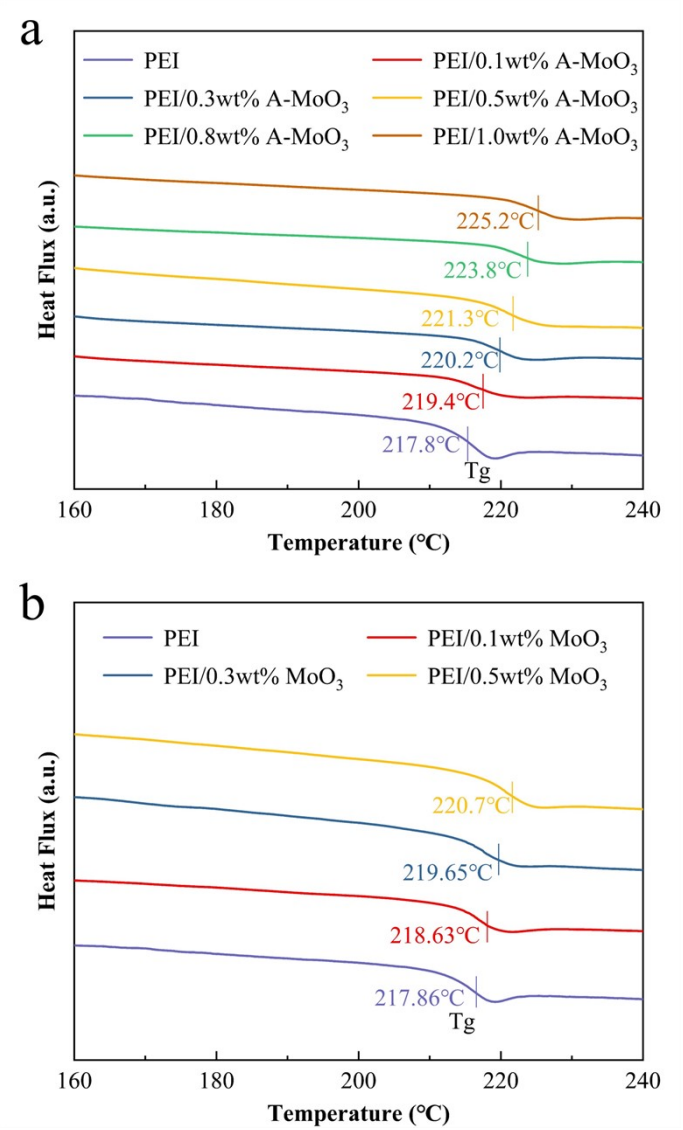

Fig. S4 DSC curves of (a) PEI/MoO_3 nanocomposites and (b) PEI/A-MoO_3 Hybrid film.

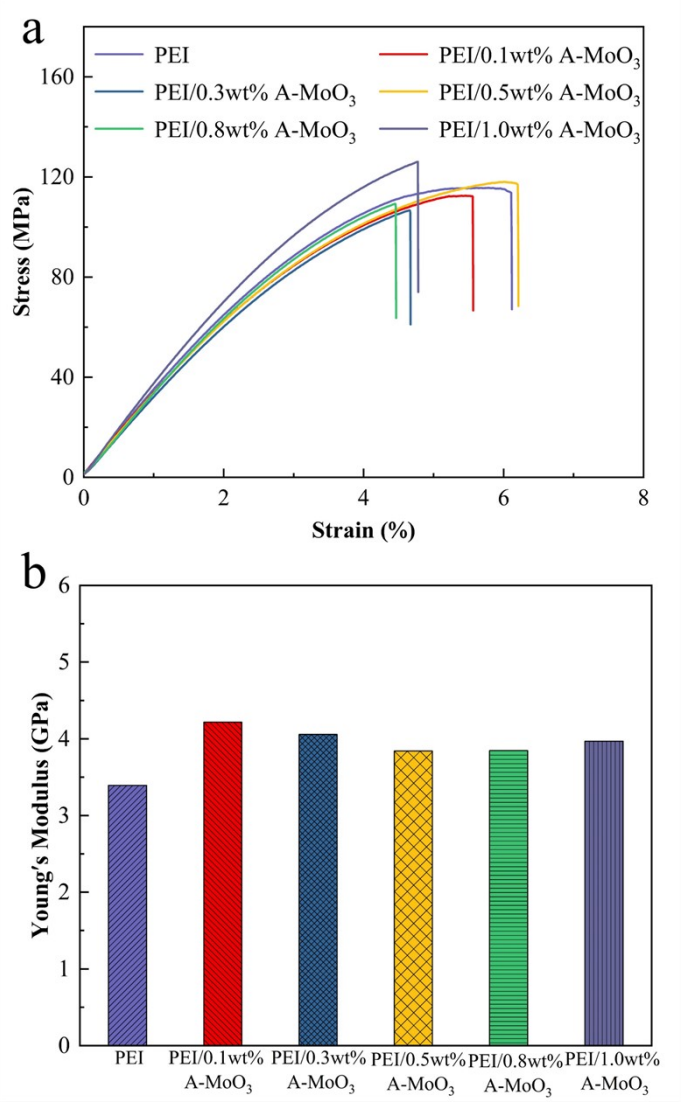

Fig. S5 (a) Stress-strain curves and (b) Yoing's modulus of pristine PEI and PEI/A-MoO_3 hybrid film.

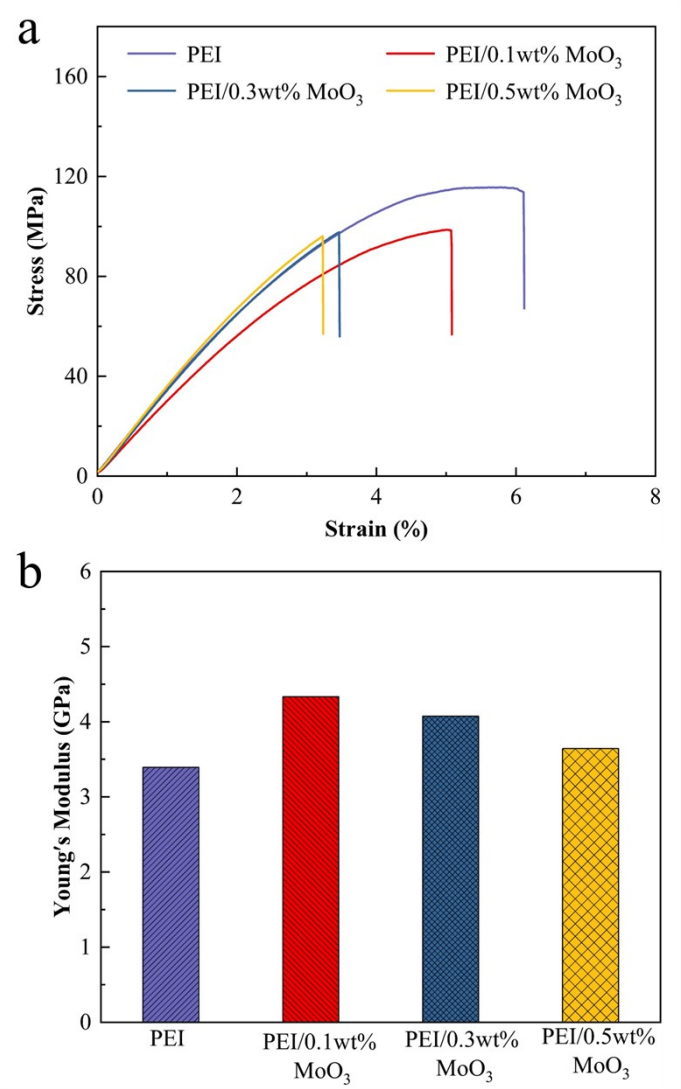

Fig. S6 (a) Stress-strain curves and (b) Yoing's modulus of pristine PEI and PEI/MoO_3 nanocomposites.

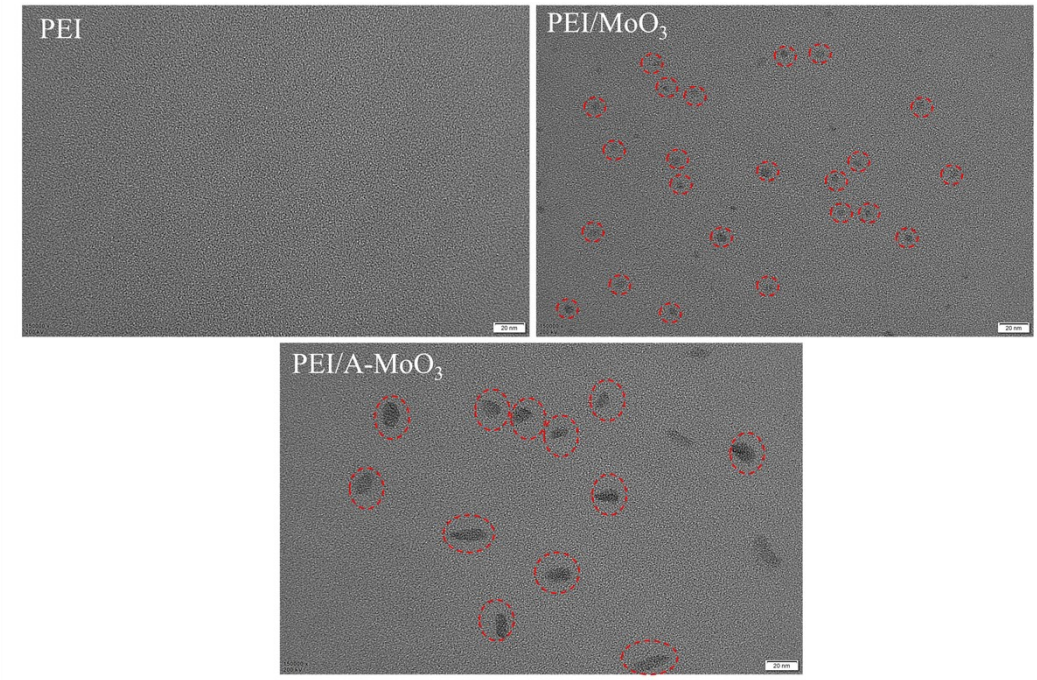

Fig. S7 Surface TEM image of pristine PEI, PEI/MoO_3 and PEI/A-MoO_3.

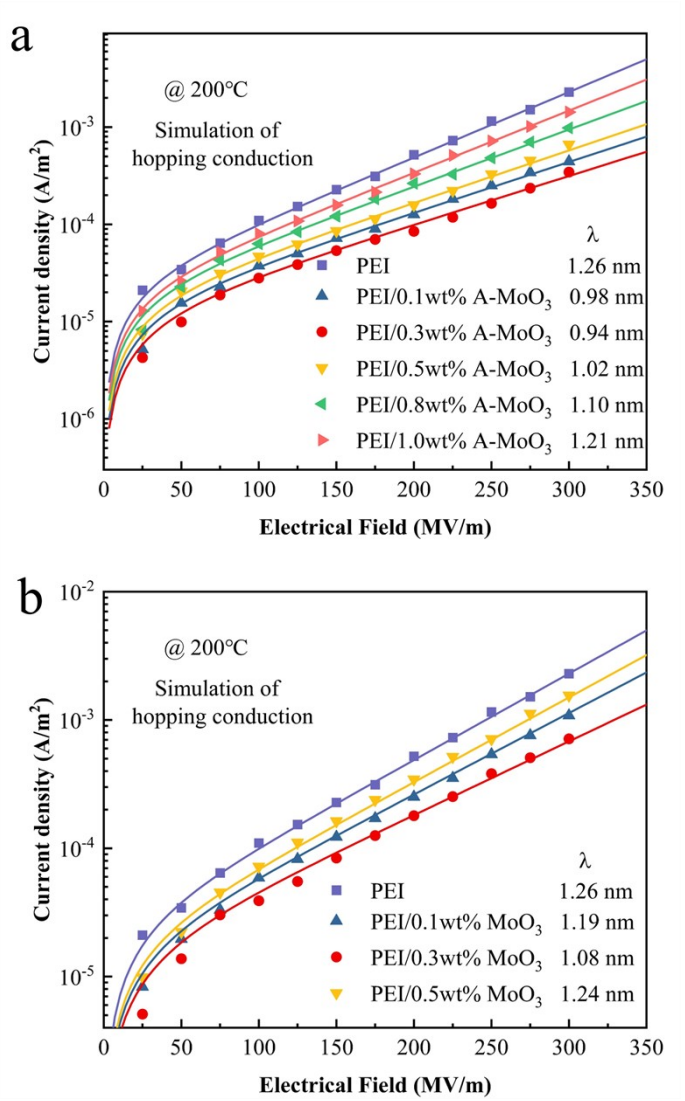

Fig. S8 Current density of (a) PEI/A-MoO_3 and (b) PEI/MoO_3 films as a function of the electric field at 200 ℃, and the solid curves represents the fit of the hopping conduction model.

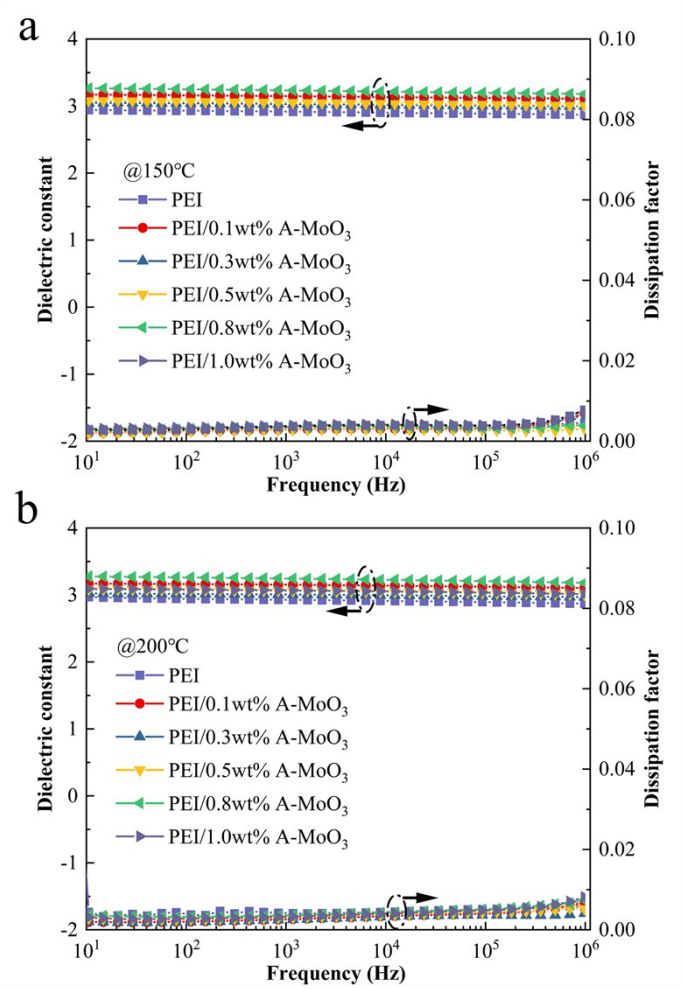

Fig. S9 Frequency dependence of dielectric constant and dissipation factor of PEI/A-MoO_3 hybrid films at (a) 150 ℃ and (a) 200 ℃.

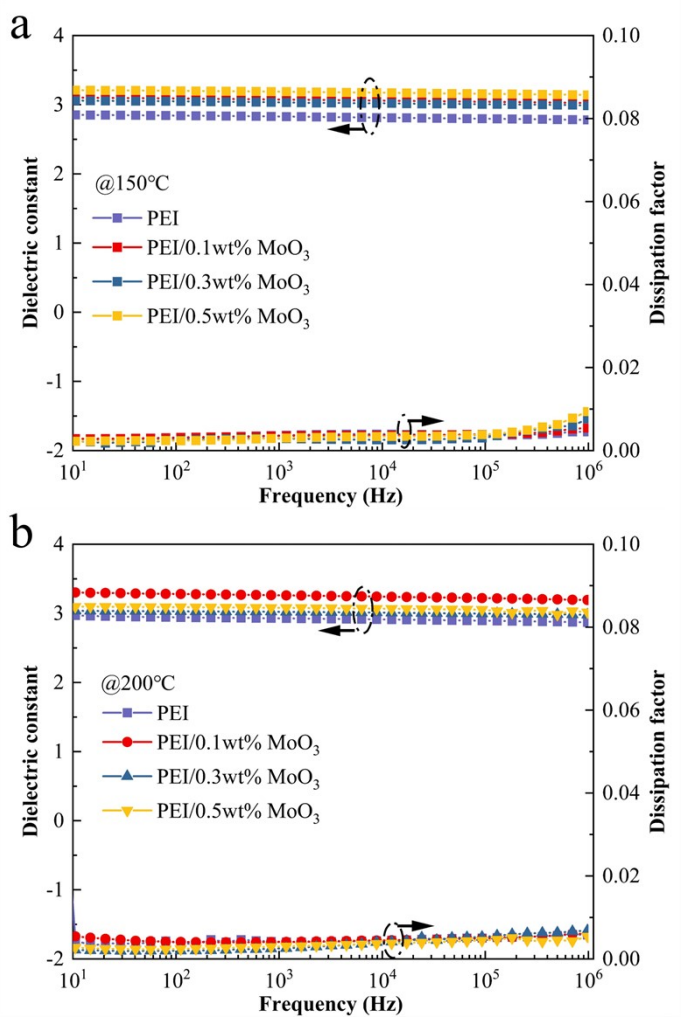

Fig. S10 Frequency dependence of dielectric constant and dissipation factor of PEI/MoO_3 films at (a) 150 ℃ and (a) 200 ℃.

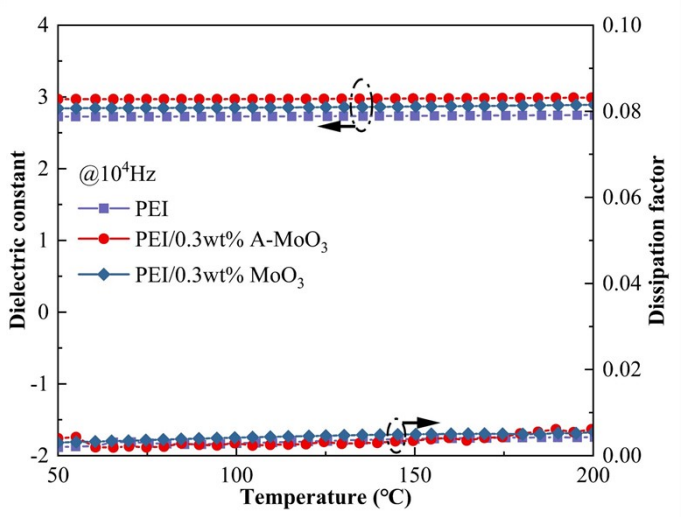

Fig. S11 Temperature dependence of dielectric constant and dissipation factor of pristine PEI, PEI/0.3wt%A-MoO_3 and PEI/0.3wt%MoO_3.

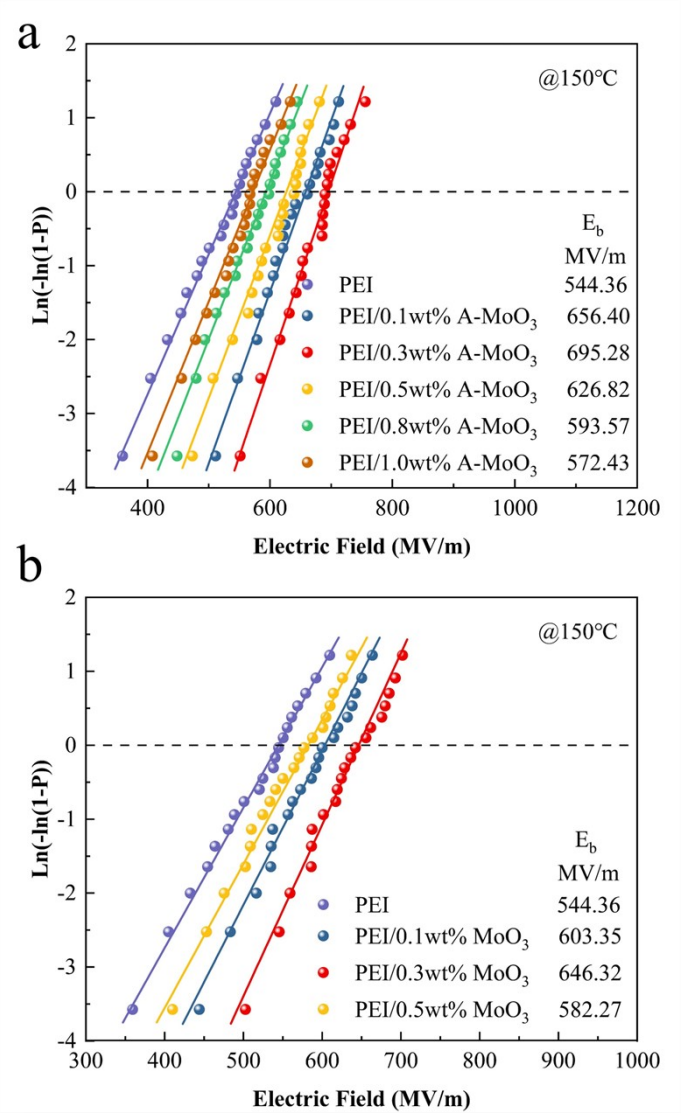

Fig. S12 Weibull statics of breakdown strength of (a) PEI/A-MoO_3 and (b) PEI/MoO_3 films at 150 ℃

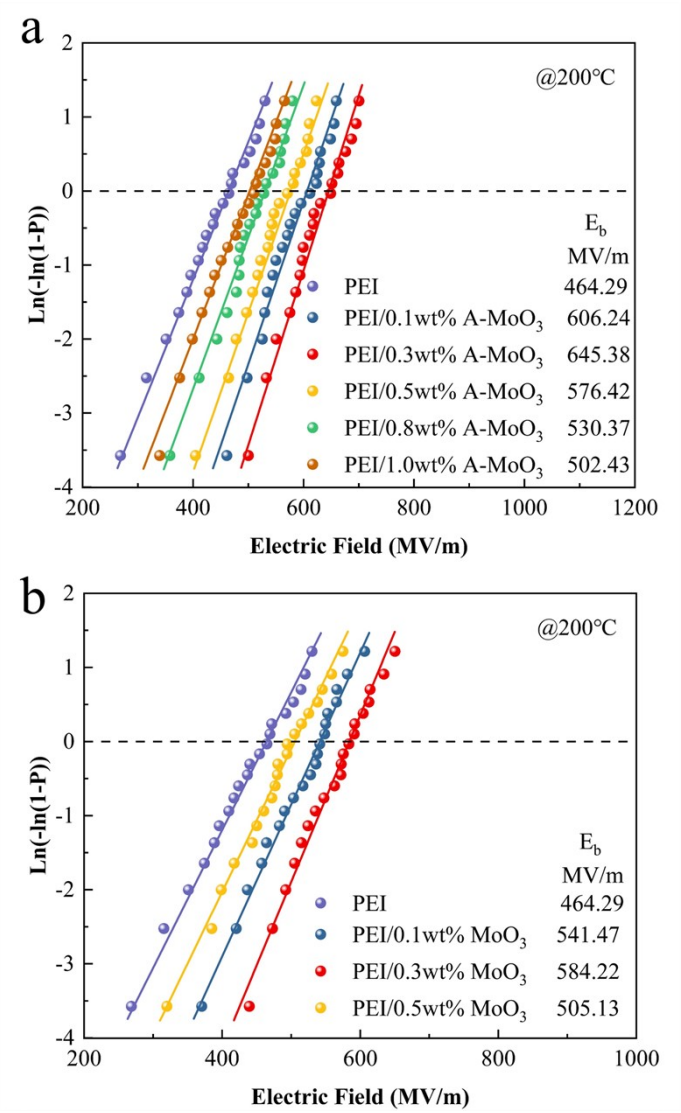

Fig. S13 Weibull statics of breakdown strength of (a) PEI/A-MoO_3 and (b) PEI/MoO_3 films at 200 ℃

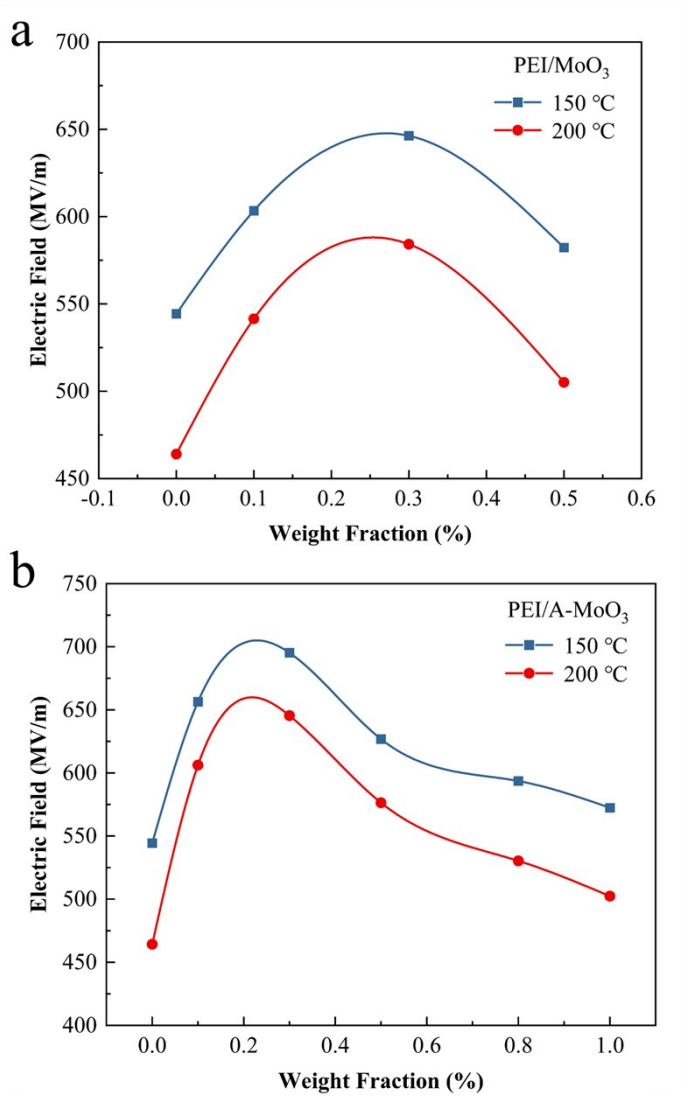

Fig. S14 Electric field of (a) PEI/MoO_3 and (b) PEI/A-MoO_3 nanocomposites versus weight fraction at 150 ℃ and 200 ℃

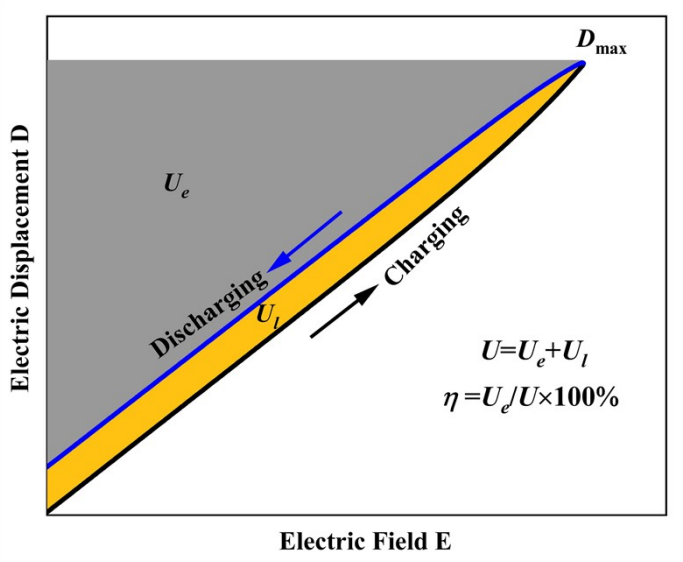

Fig. S15 Schematic *D-E* loop of the dielectric material.

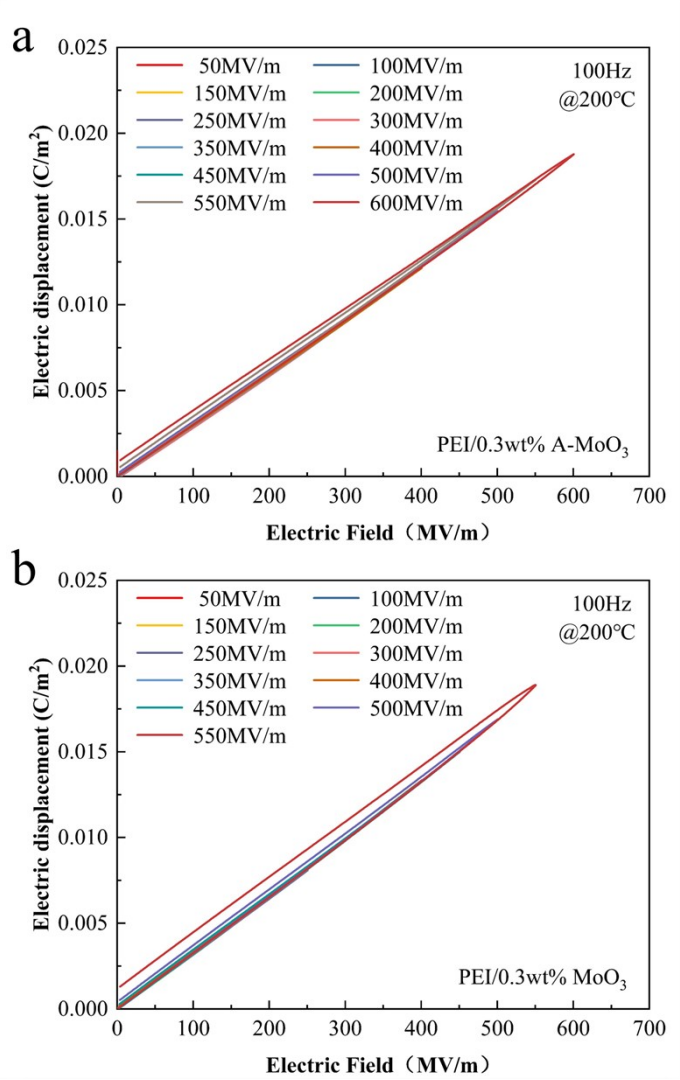

Fig. S16 Electric displacement-electric filed loop (*D-E* loop) of (a) PEI/0.3wt%A-MoO_3 and (b) PEI/0.3wt%MoO_3 at 200 ℃ and 100 Hz.

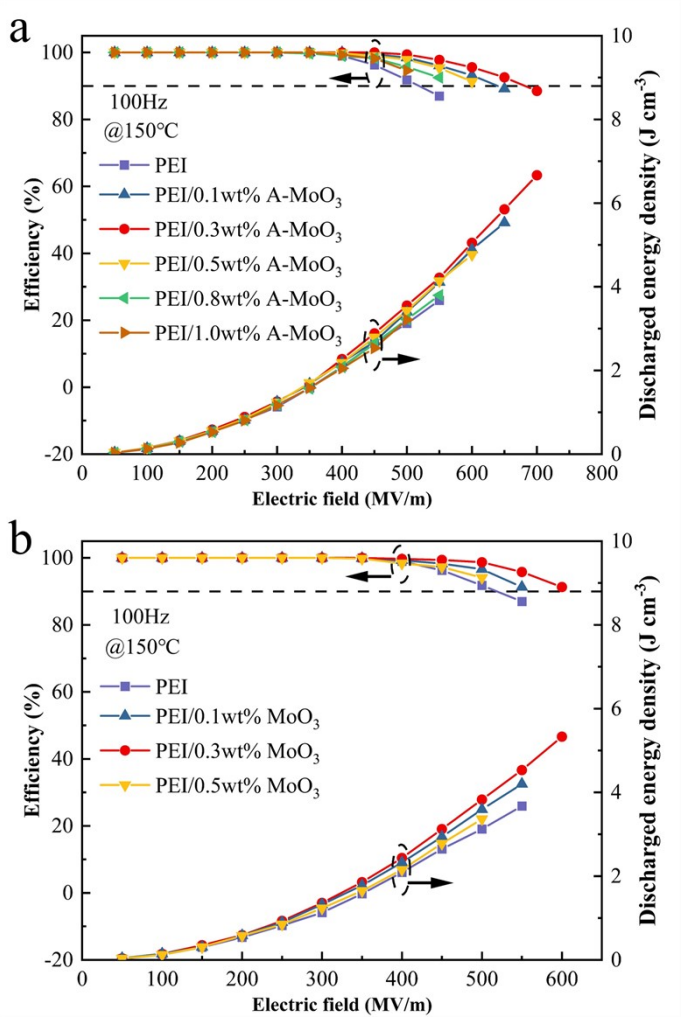

Fig. S17 Discharged energy density and efficiency of (a) PEI/A-MoO_3 and (b) PEI/MoO_3 at 150 ℃ and 100 Hz.

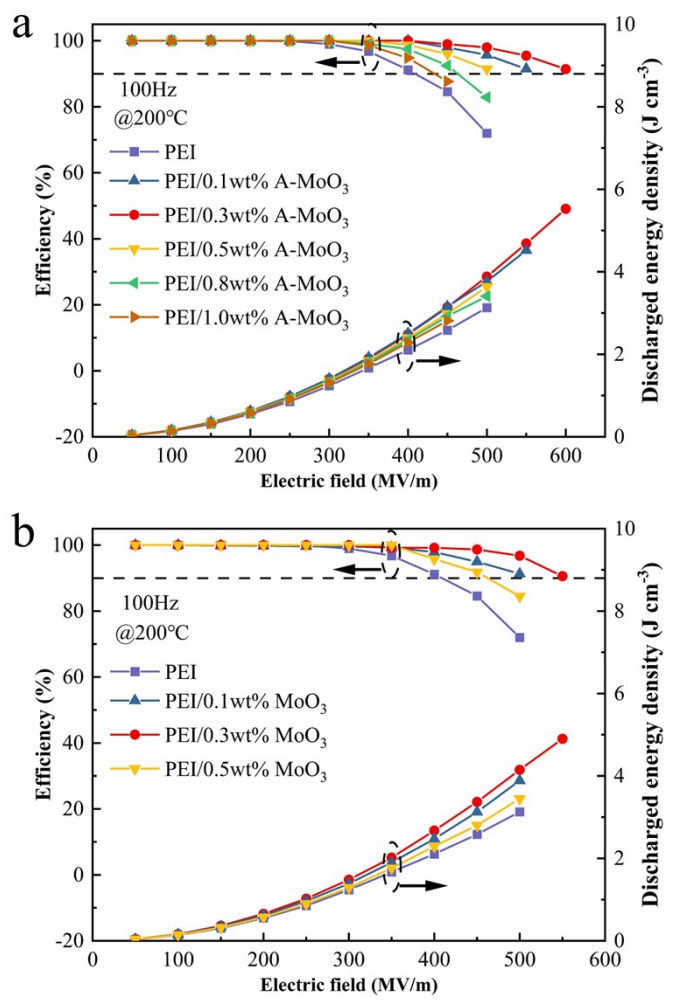

Fig. S18 Discharged energy density and efficiency of (a) PEI/A-MoO_3 and (b) PEI/MoO_3 at 200 ℃ and 100 Hz.

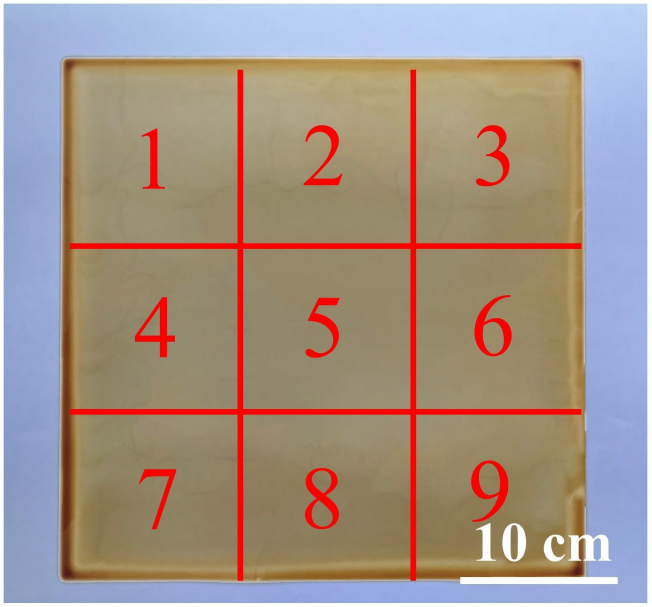

Fig. S19 Photograph of the PEI/A-MoO_3 hybrid film of 20 ×20 cm^2 area