Supporting Information

TiO_2 nanoparticles/polyimide nanocomposite for ultrahigh-temperature energy storage performance

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Figures

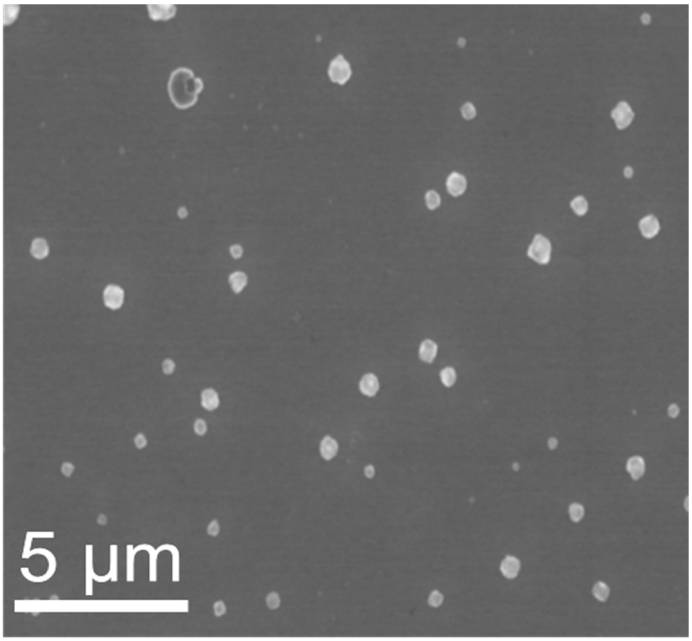

Figure S1. SEM image of TiO_2 nanoparticles at low magnification.

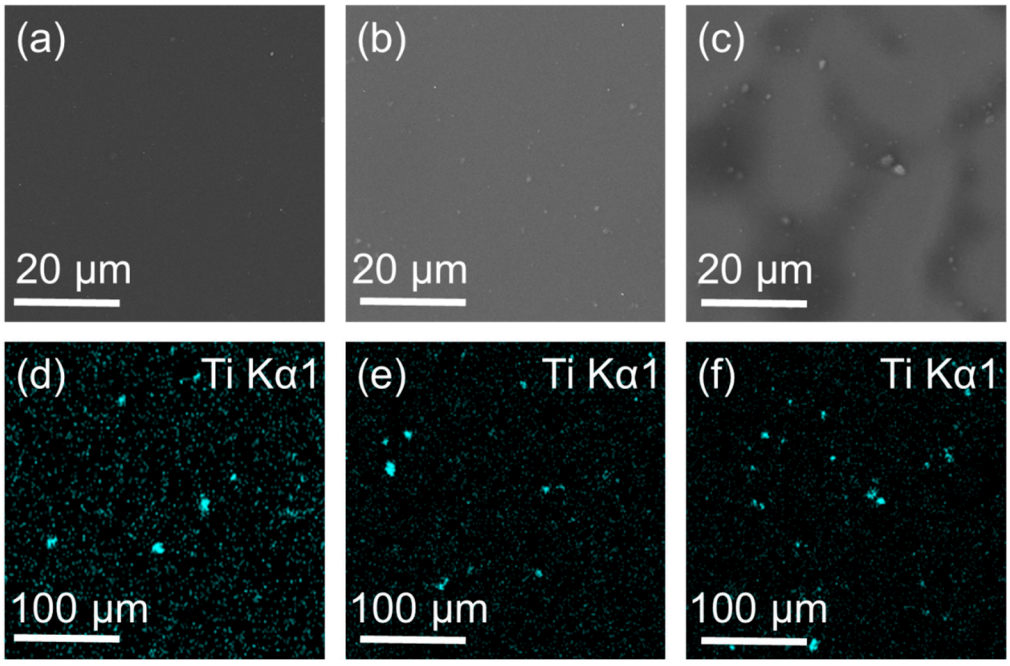

Figure S2. Characterization of TiO_2/PI nanocomposites. **(a)**, **(b)**, **(c)** SEM image and **(d)**, **(e)**, **(f)** corresponding respectively EDS mapping of TiO_2/PI nanocomposites with various loading contents of 1, 2, and 5 wt%.

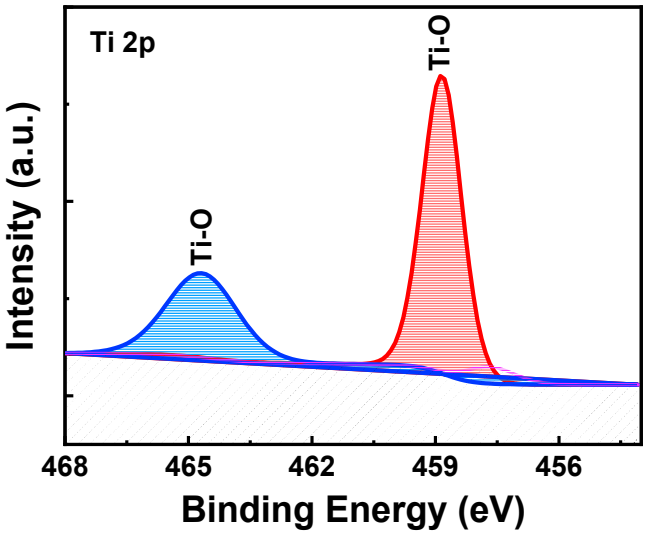

Figure S3. XPS spectra of Ti 2p components of TiO_2/PI nanocomposite.

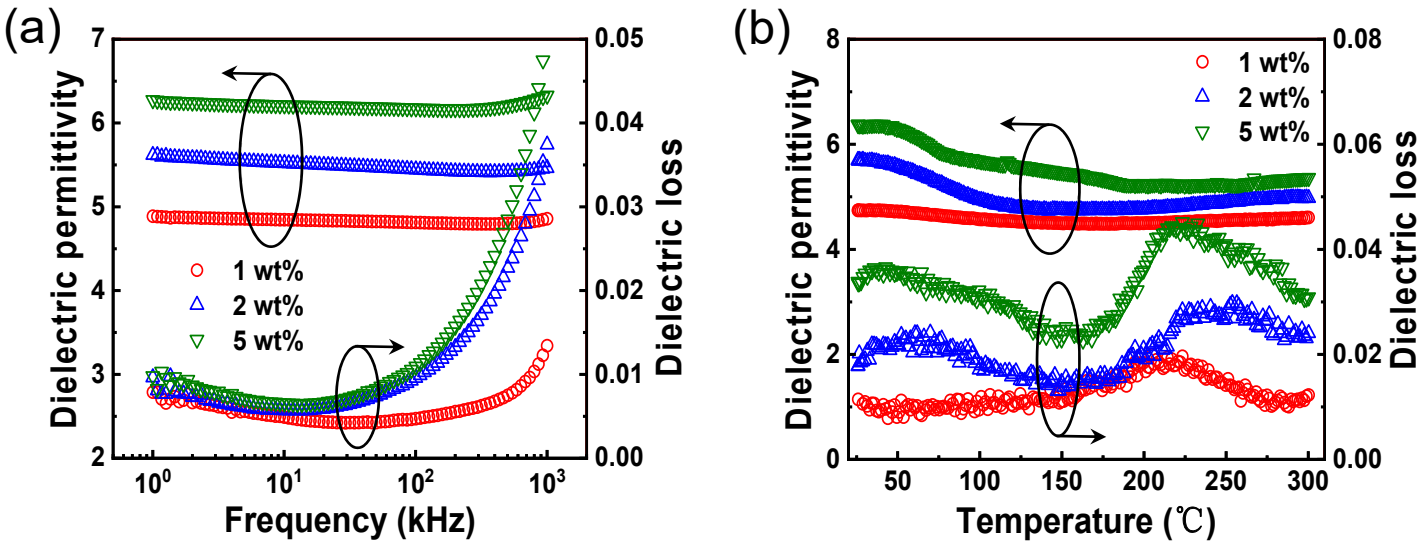

Figure S4. Dielectric properties of solid TiO_2/PI nanocomposites. Frequency-dependent **(a)** dielectric permittivity and dielectric loss of solid TiO_2/PI nanocomposites with various loading contents of 1, 2, and 5 wt% at RT. Temperature-dependent **(b)** dielectric permittivity and dielectric loss of solid TiO_2/PI nanocomposites with various loading contents of 1, 2, and 5 wt% at 1 kHz.

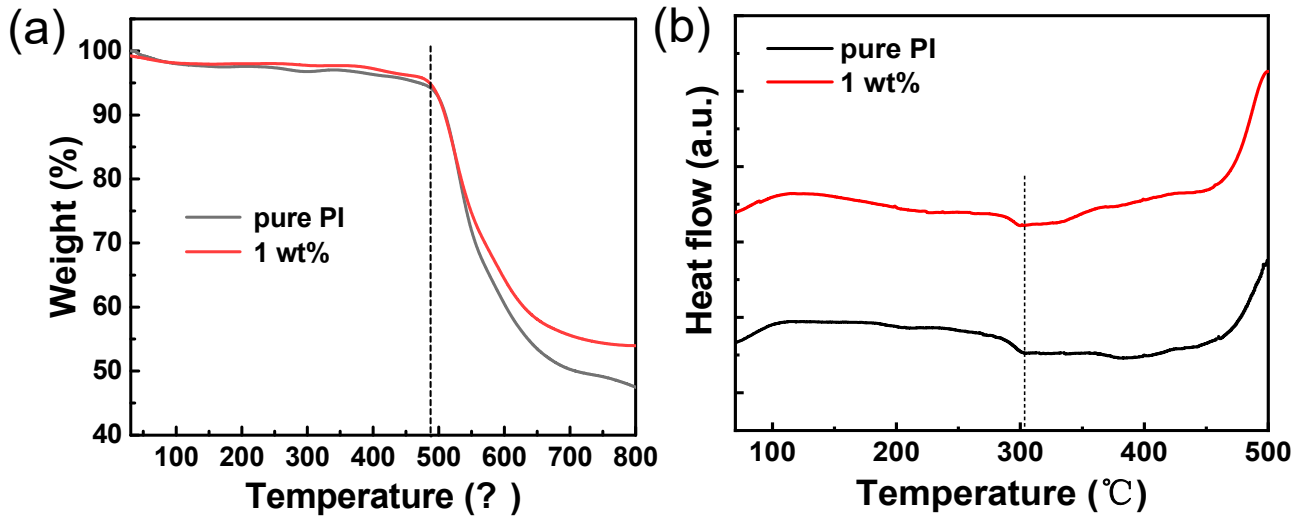

Figure S5. (a) TGA at the temperatures of 30 ℃ to 800 ℃ and **(b)** DSC curves at 100 ℃ to 500 ℃ of pure PI and TiO_2 nanoparticles/PI nanocomposite with 1 wt% content.

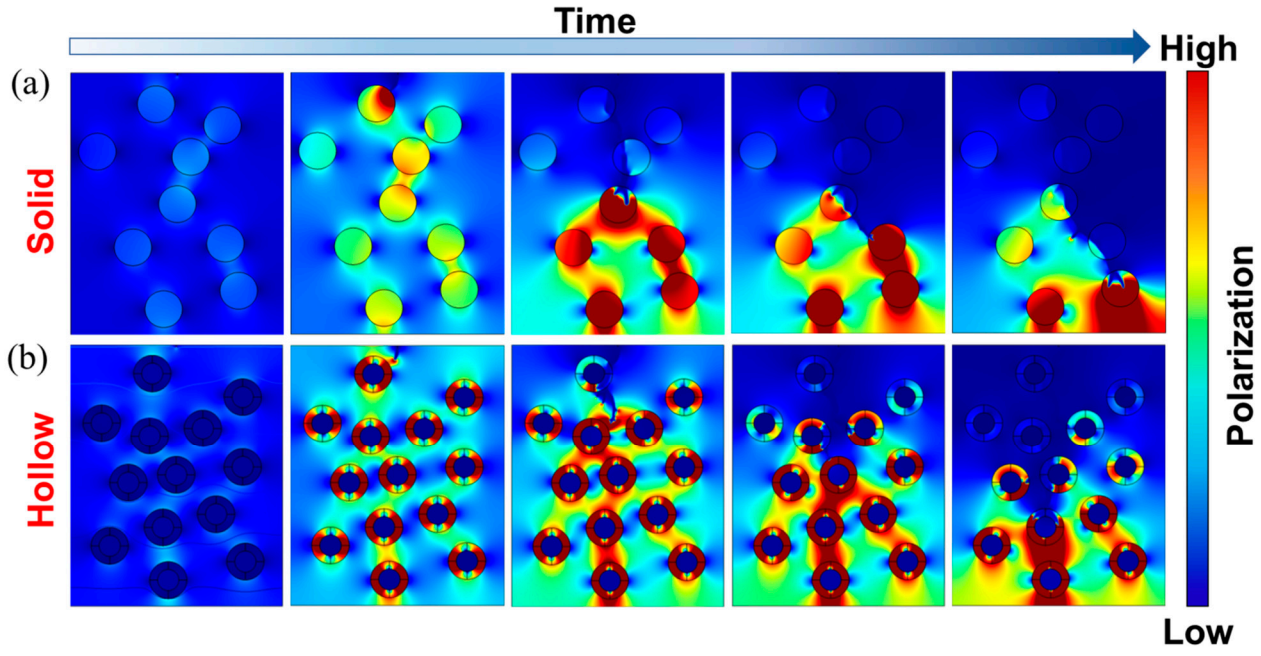

Figure S6. Finite element simulation of polarization evolution of TiO_2/PI nanocomposites with **(a)** solid and **(b)** hollow nanofillers.

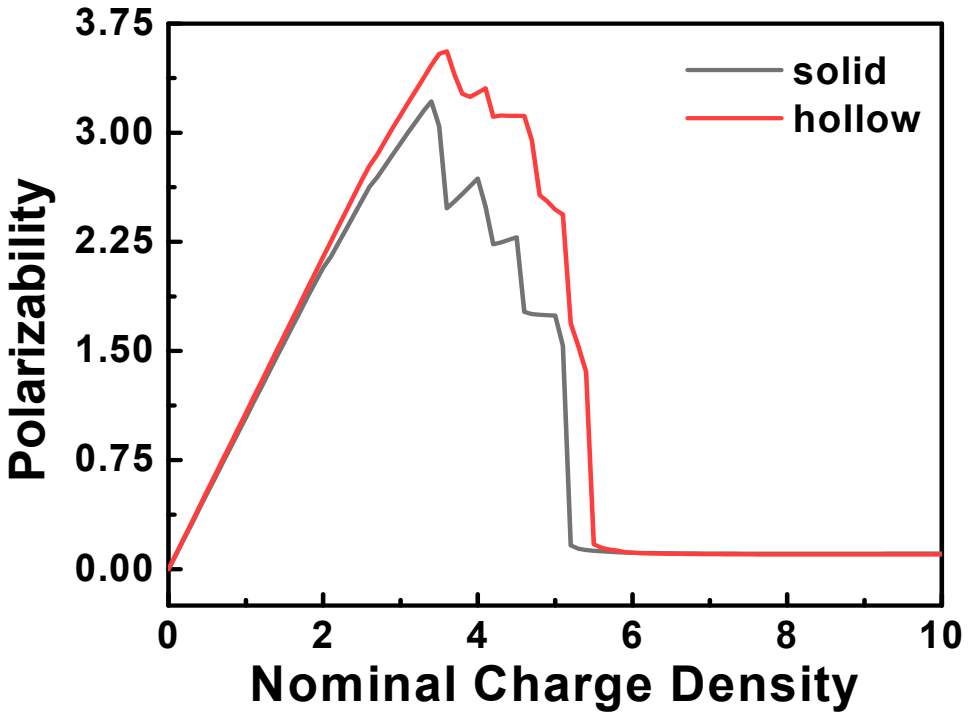

Figure S7. Relationship between nominal charge density and polarizability for PI-based nanocomposites with solid (grey curve) and hollow (red curve) nanoparticles.