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Supporting Information

Excellent energy density of polymer nanocomposites containing $BaTiO_3$@Al_2O_3 nanofibers induced by moderation interfacial area

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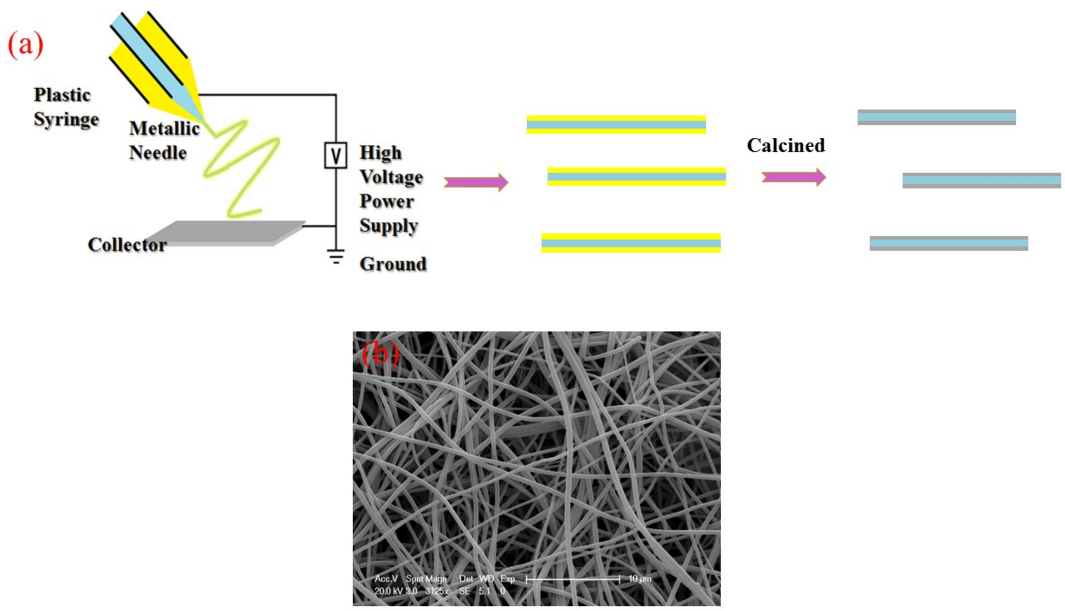

Fig. S1 (a) Schematic of forming process of core-shell structure BT@Al_2O_3 nanofibers; (b) SEM image of the as-electrospun fibers.

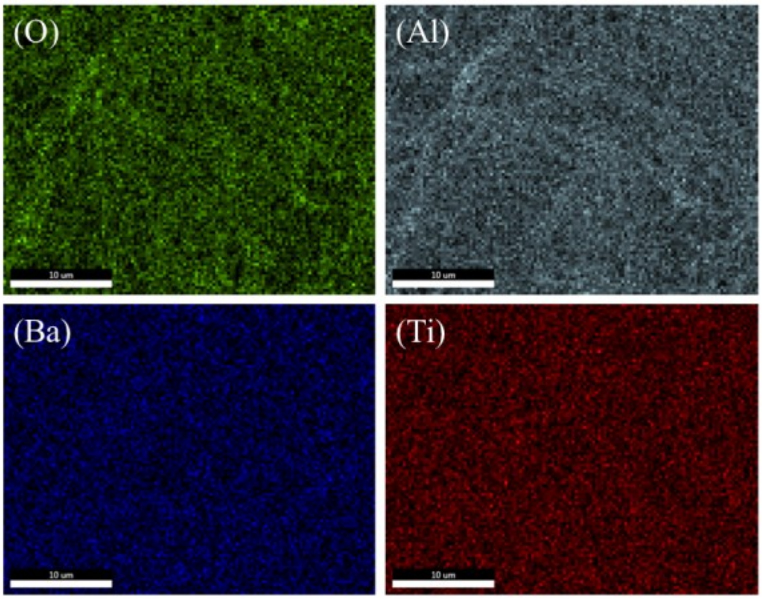

Fig. S2 The mapping of core-shell structure BT@Al_2O_3 nanofibers.

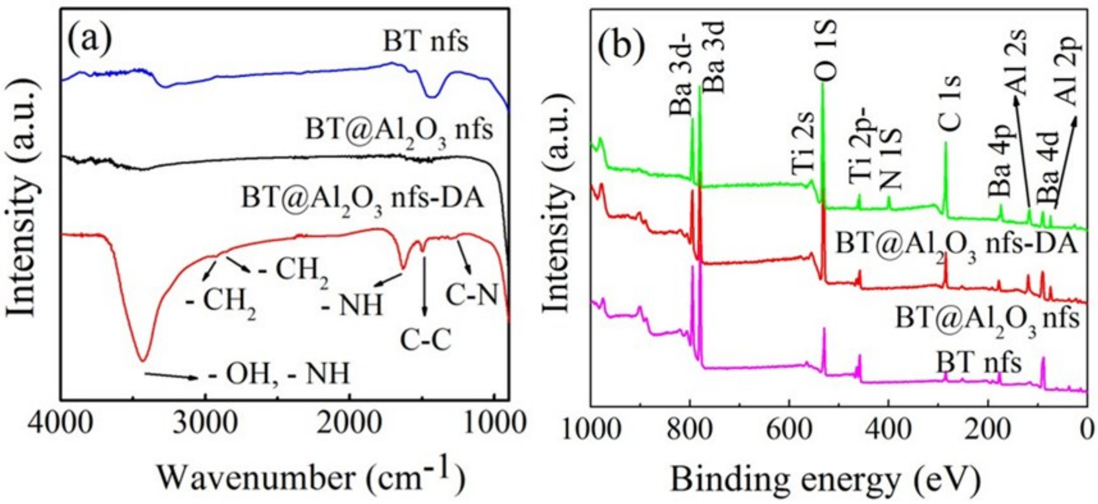

Fig. S3 (a) FT-IR spectra (b) XPS spectra of BT nfs, BT@Al_2O_3 nfs and BT@Al_2O_3 nfs-DA.

IR absorption peaks appears at 3000-3650 cm^{-1}(–OH groups and –NH), 2925 cm^{-1} and 2854 cm^{-1}(−CH_2), 1626 cm^{-1}(–NH), 1505 cm^{-1}(–C–C) and 1254 cm^{-1}(–C–N), imply that the dopamine have been introduced successfully onto BT@Al_2O_3 nanofibers surface. Two relatively strong peaks at approximately 74.3 and 119.2 eV can be discovered of the BT@Al_2O_3, corresponding to the Al 2s and Al 2p peaks of Al_2O_3. Compared with BT and BT@Al_2O_3, the peak of N1s is observed BT@Al_2O_3-DA at about 401 eV owing to free $-NH_2$, affirming the successful introduced of dopamine on the BT@Al_2O_3 nanofibers surface.

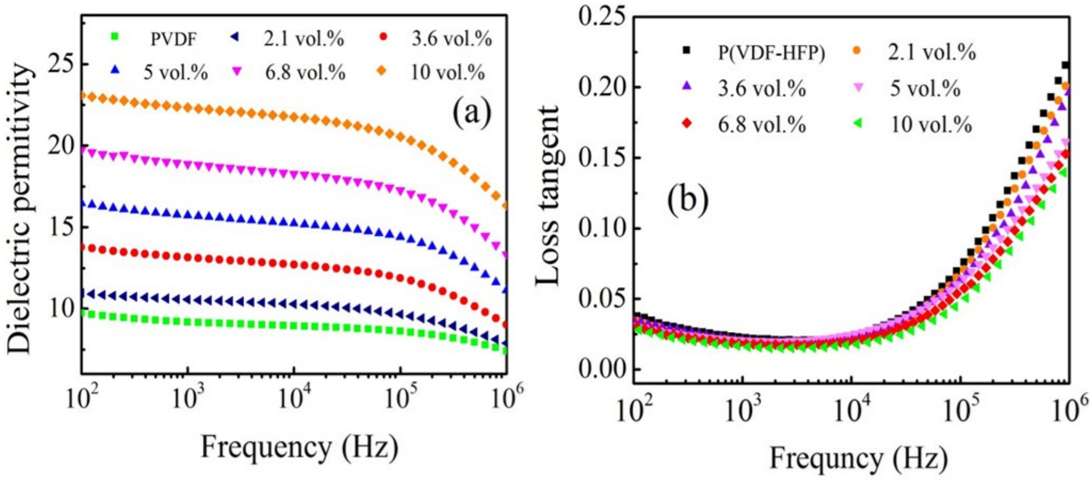

Fig. S4 Frequency-dependence of the (a) dielectric constant and (b) dielectric loss tangent of BT@Al_2O_3 nfs/PVDF nanocomposites.

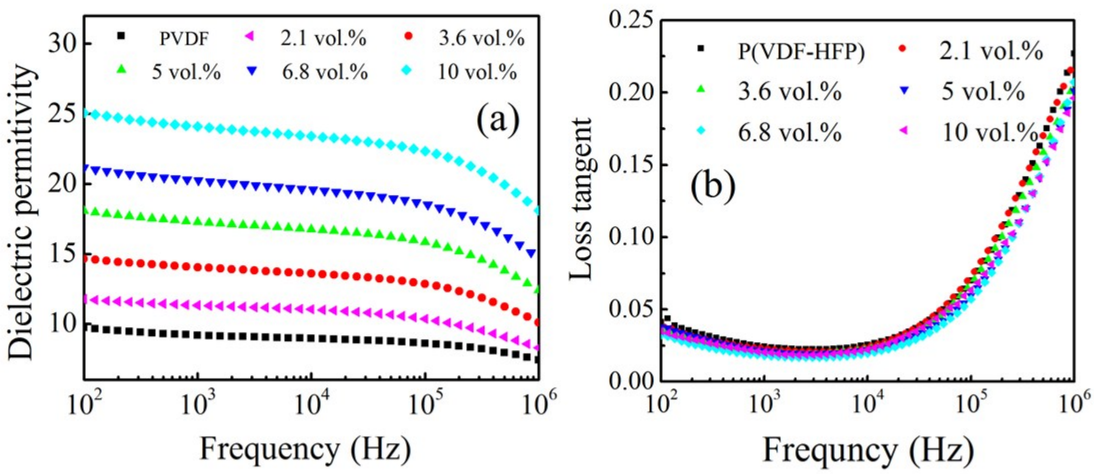

Fig. S5 Frequency-dependence of the (a) dielectric constant and (b) dielectric loss tangent of BT nfs/PVDF nanocomposites.

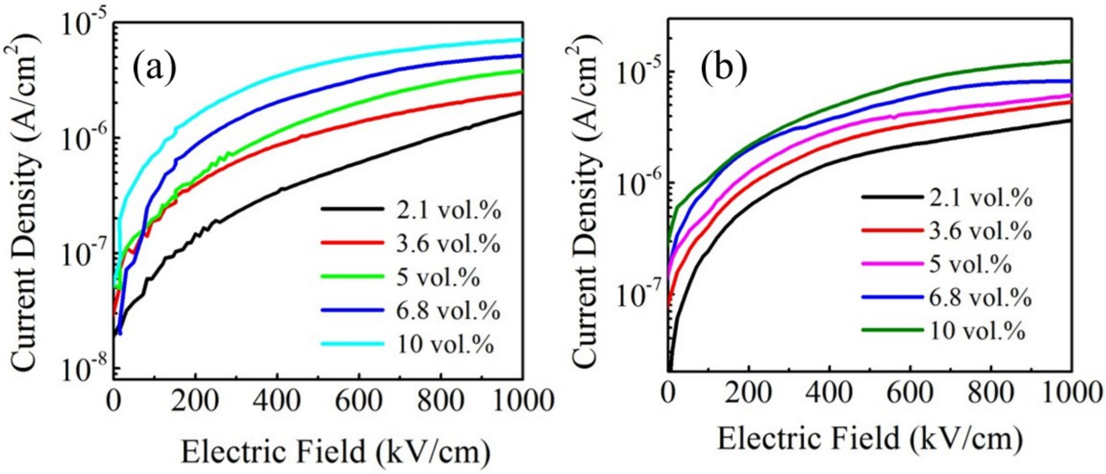

Fig. S6 The leakage current density of (a) BT nfs/PVDF (b) BT@Al_2O_3 nfs/PVDF nanocomposites.

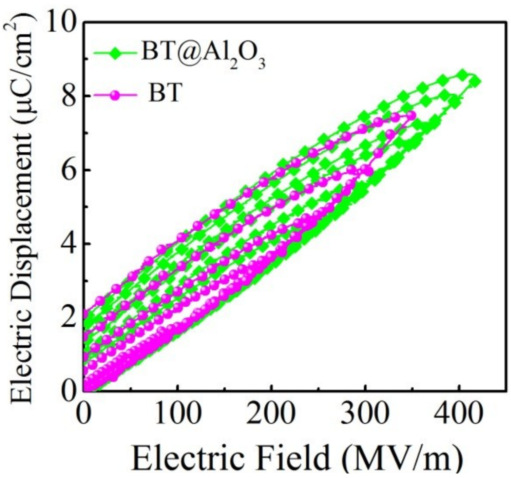

Fig. S7 D-E curves of the 5 vol. % BT nfs/PVDF and BT@Al_2O_3 nfs/PVDF nanocomposites.

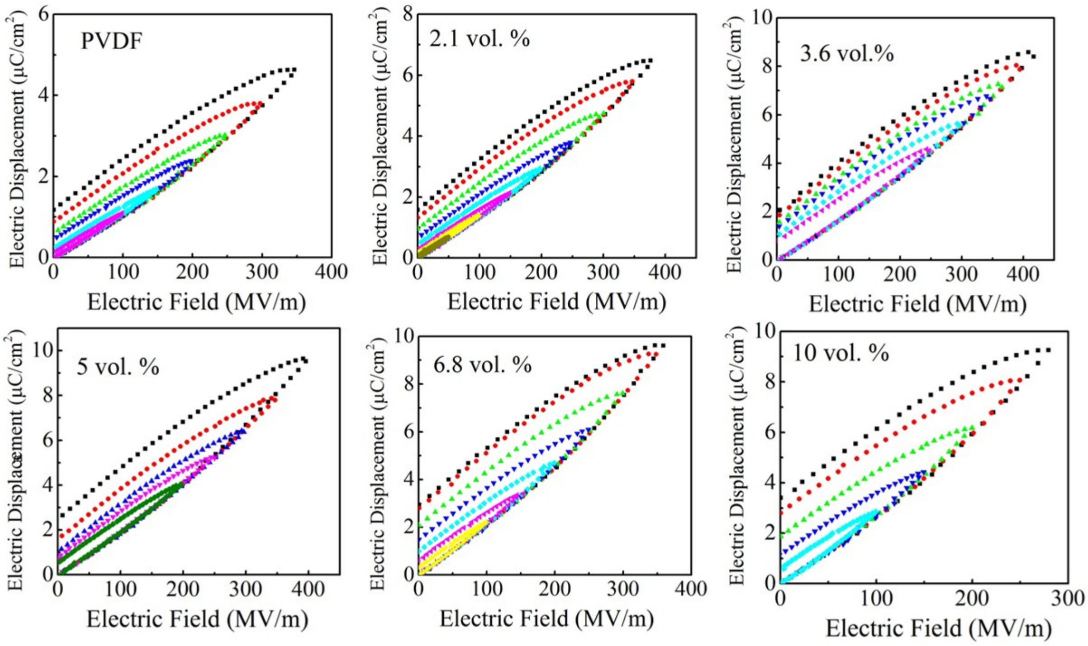

Fig. S8 D-E curves of the BT@Al_2O_3 nfs/PVDF nanocomposites loading with different concentration of the fillers.