Electronic Supplementary Information

Highly enhanced dielectric strength and energy storage density in hydantoin@$BaTiO_3$–P(VDF-HFP) composites by a sandwich–structure

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Table S1. Dielectric constants and breakdown strength of single layer of P(VDF-HFP) composites with different BT loadings.

Composite	ε @ 1 kHz	E_b (kV mm^{-1})
P(VDF-HFP)	6.92	360
10 vol% BT	13.07	330
20 vol% BT	20.24	315
30 vol% BT	24.28	240
40 vol% BT	31.96	190
50 vol% BT	48.96	187

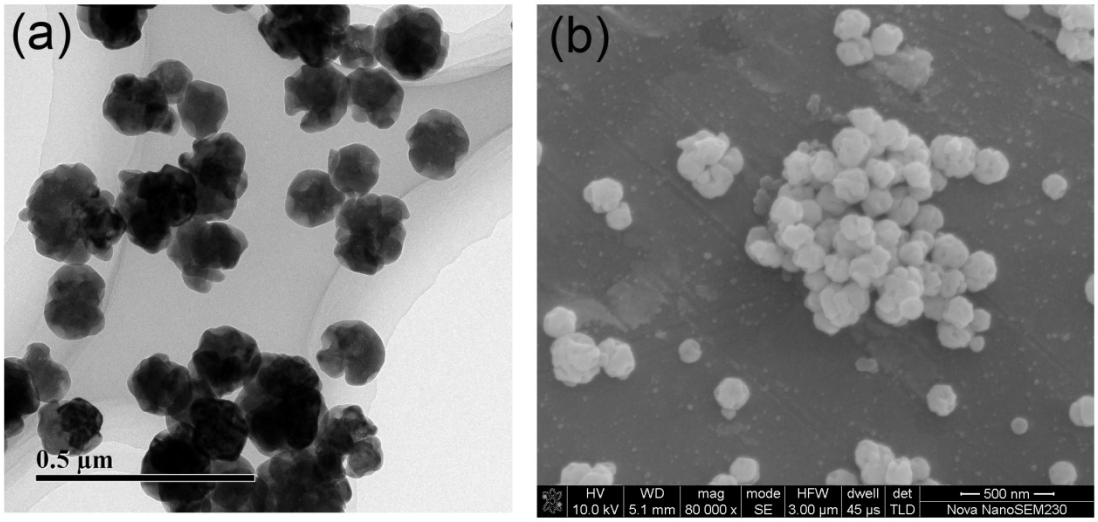

Fig. S1 (a) TEM image and (b) SEM image of pure BT. The sizes of the pure BT particles from TEM image and SEM image were almost similar with the hydantoin resin coated BT particles in Fig. 2.

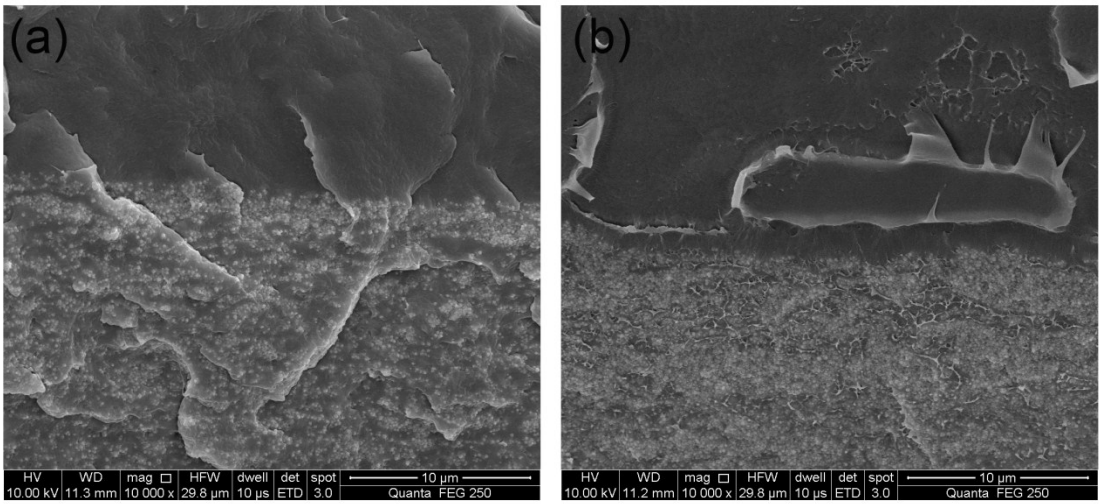

Fig. S2 High–magnification SEM images of sandwich–structured composites with (a) 20 vol% BT, (b) 40 vol% BT. The hydantoin resin coated BT particles exhibited homogeneous dispersing. Besides, the boundary lines between the central layers and neighboring layers were clearly observed.

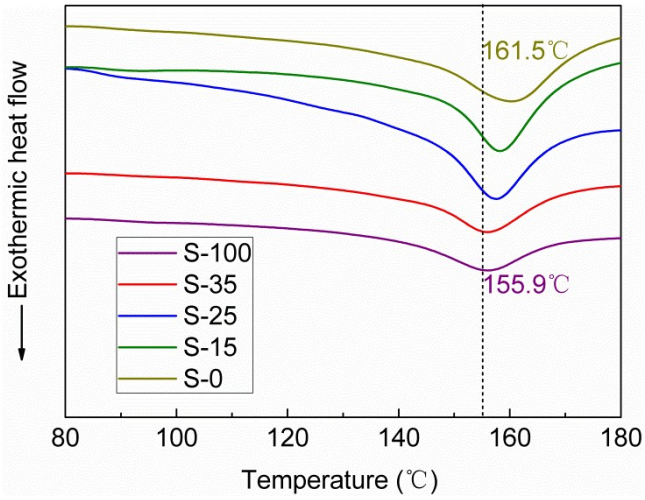

Fig. S3 DSC curves of the samples during the heating cycle at a rate of 10 ^{o}C min^{-1} under N_2 atmosphere. The results illustrate that the BT particles in the composites increase the crystallization temperature by 5.6 °C, from 155.9 °C in the pure P(VDF-HFP) polymer (S–100) to 161.5 °C in the single layer sample (S–0), which shows

indeed the BT particles facilitate the crystallization process in the polymer matrix.

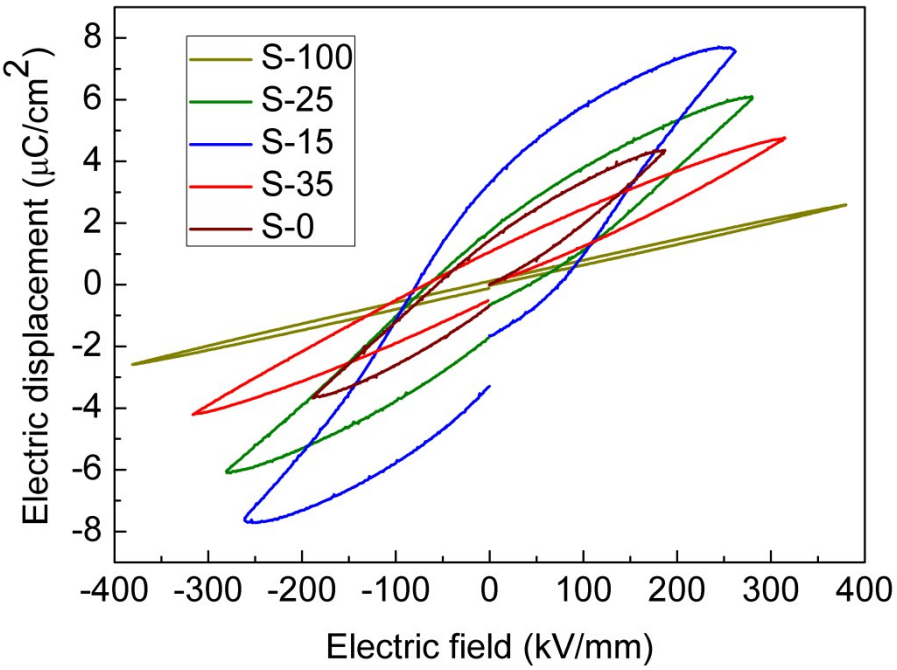

Fig. S4 *D–E* loops of the samples at maximum electric field. As can been seen from Fig. S4, the electric displacement of the sandwich–structured composites increased notably compared with the single layer composites and pure P(VDF-HFP) polymer. Due to the introduced central layer largely enhanced the breakdown strength, the electric displacement of S–15 increased to 7.68 uC cm^{-2}, compared with the pure P(VDF-HFP) (4.36 uC cm^{-2}).