

Electronic Supplementary Material

Biaxially Oriented Ternary Polypropylene Composite Film with Enhanced Energy Storage Property at Elevated Temperature

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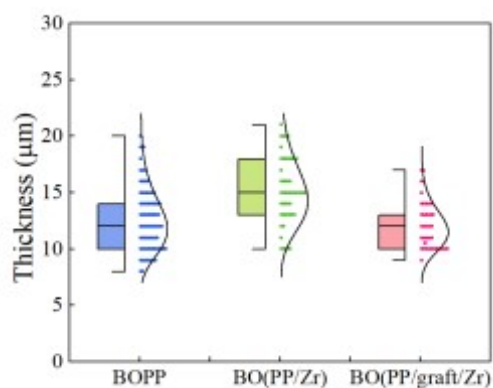


Figure. S1 The thickness of composites films after biaxial orientation

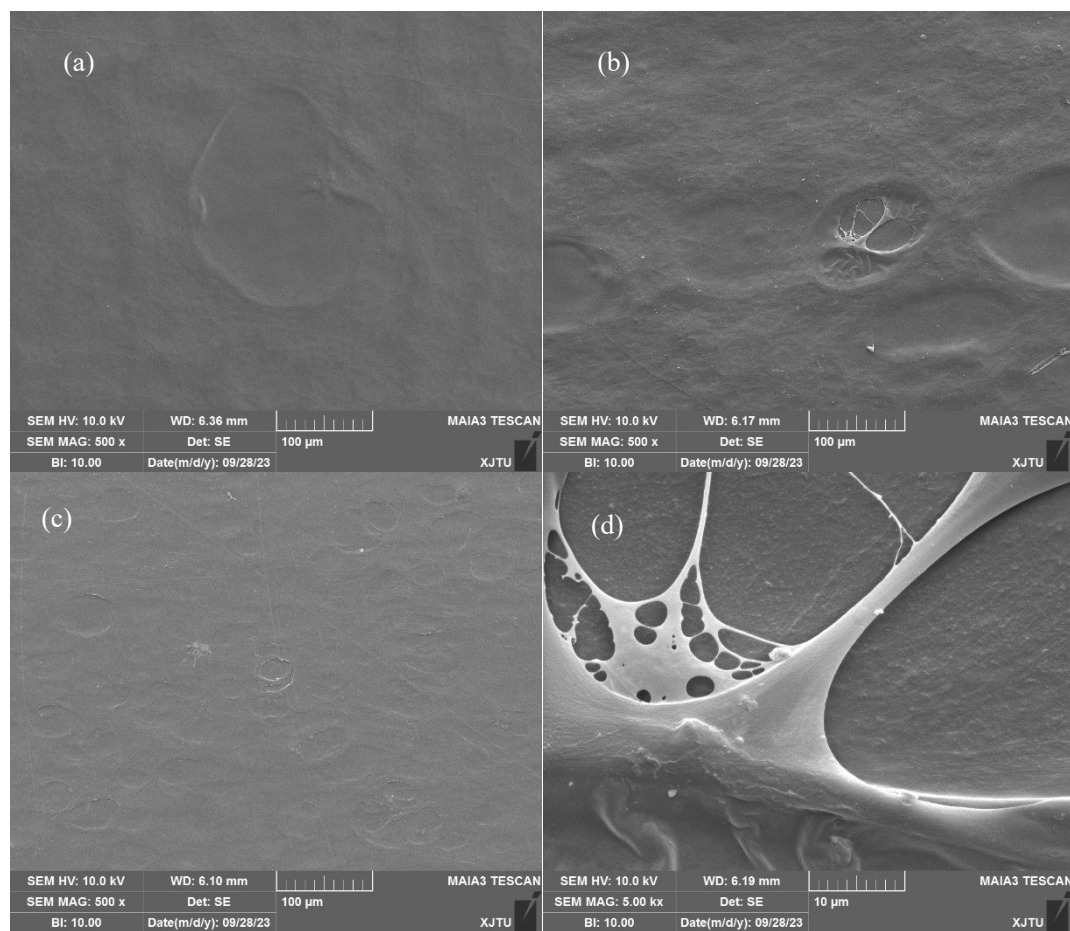


Figure. S2 The original image of Fig.2(d): (a) BOPP, (b) BO(PP/Zr), (c) BP(PP/AA/Zr) and (d) the partial enlarged image of BO(PP/Zr).

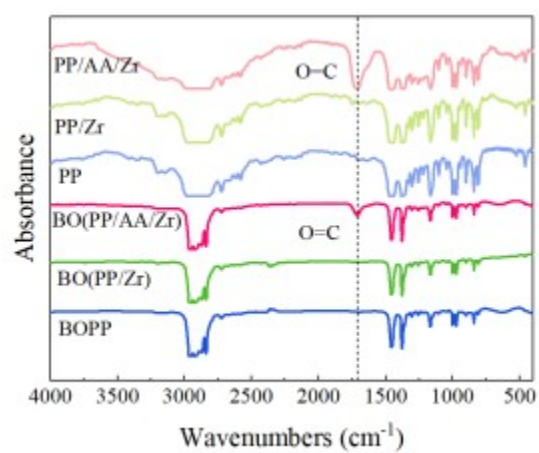


Figure. S3 FTIR spectra

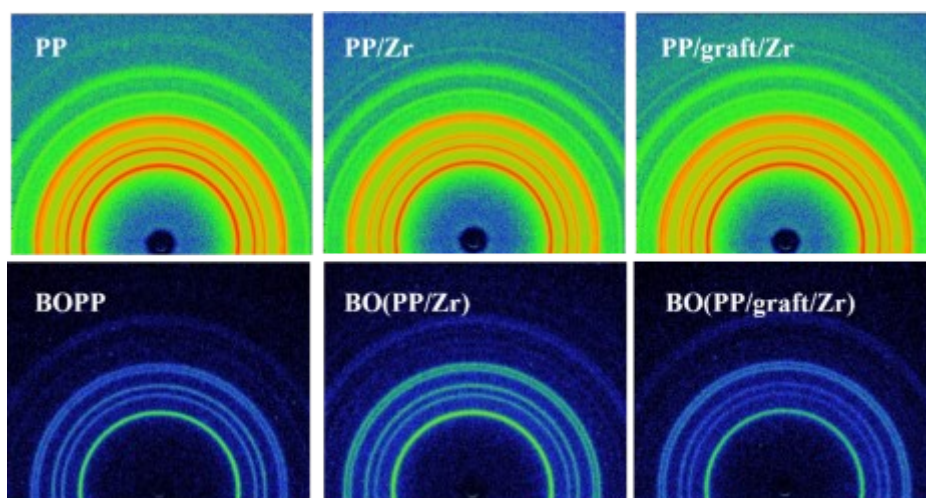


Figure. S4 2D-WAXD patterns of all samples

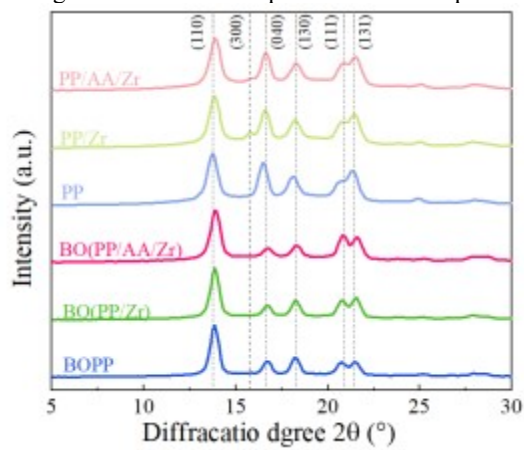


Figure. S5 1D-WAXD curves by integrating the 2D-WAXD pattern.

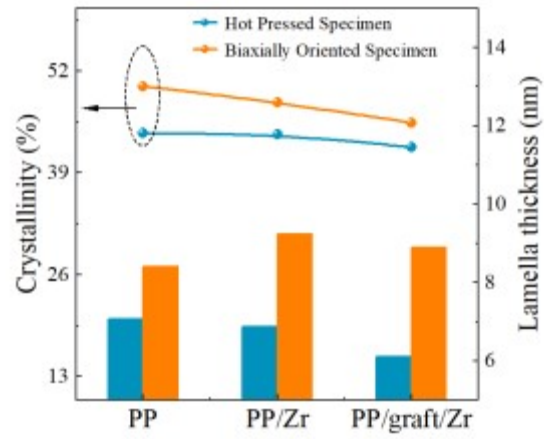


Figure. S6 Crystallinity and lamellar size of specimens before and after biaxial stretching.

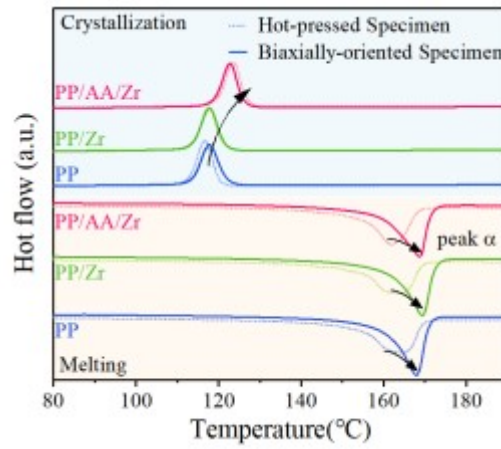


Figure. S7 DSC temperature spectra.

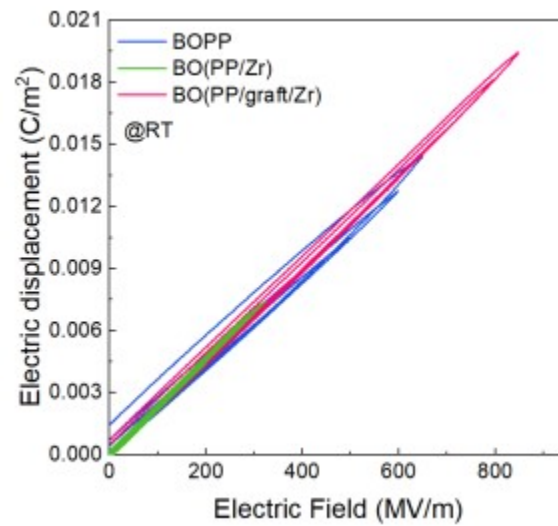


Figure. S8 The electric hysteresis loops of biaxially oriented films at room temperature.

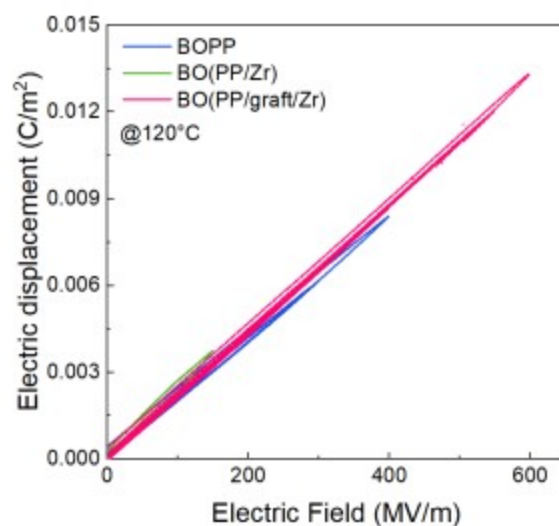


Figure. S9 The electric hysteresis loops of biaxially oriented films at 120°C .

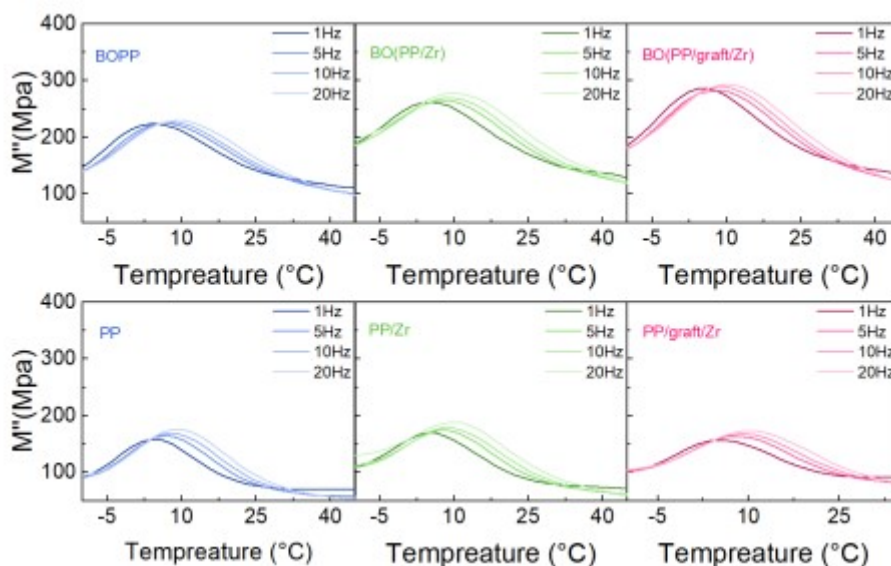


Figure. S10 Loss modulus (M'') of all the samples films measured by DMA at the different frequencies of 1, 5, 10 and 20 Hz.