



Supporting Information

A Novel Method to Prepare Transparent, Flexible and Thermally Conductive Polyethylene/Boron Nitride Films

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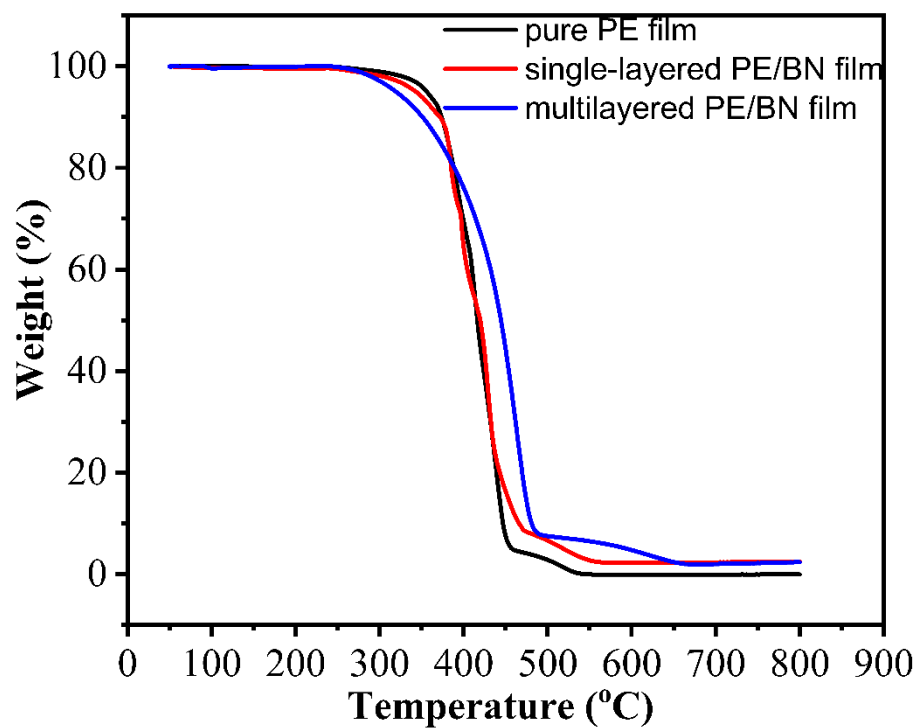


Figure S1. The TGA curve of pure PE film, single-layered PE/BNPs film and multilayered PE/BNPs film.

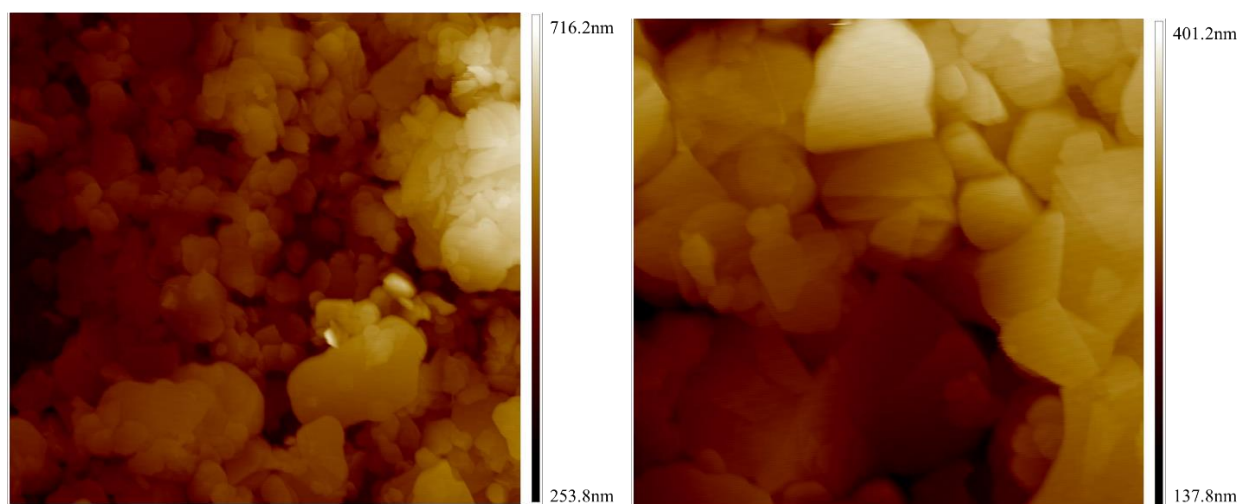


Figure S2. AFM image of single-layered PE/BNPs film.

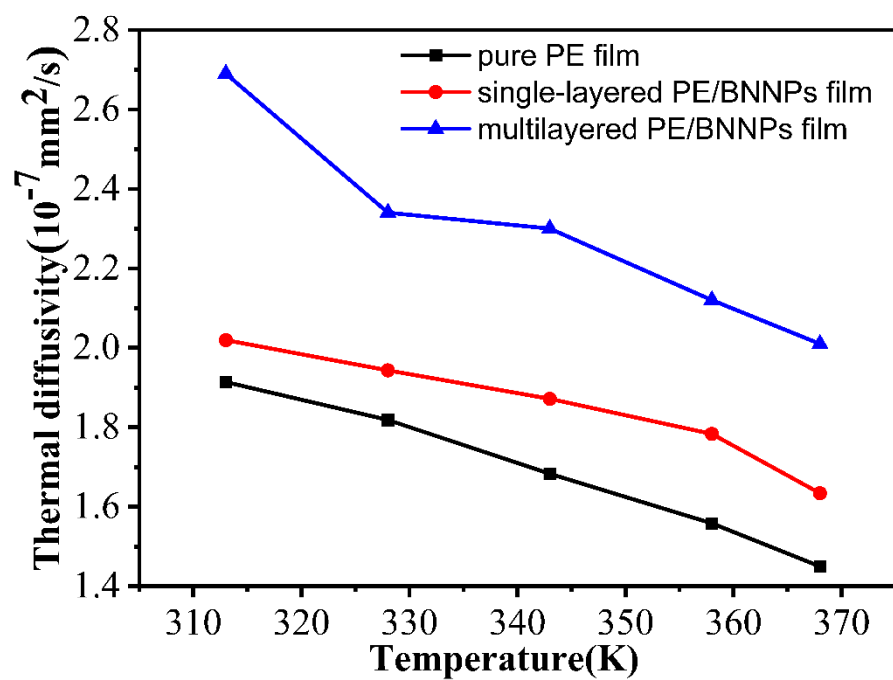


Figure S3. The calculated in-plane thermal diffusivity of different samples.



Figure S4. The optical photo of single-layered PE/BNNPs film.

The specific breakdown voltage was calculated from the Weibull distribution, as shown in following formula:

$$P = 1 - \exp \left[- \left(\frac{E}{E_0} \right)^\beta \right] \quad (1)$$

Deriving this formula, the following formula can be obtained:

$$\ln[-\ln(1-P)] = \beta \ln E - \beta \ln E_0 \quad (2)$$

where P is the cumulative probability density of the electrical breakdown of the sample, β is the shape factor, E_0 is the breakdown voltage. Equation 2 is the basis of the linear fitting in Figures S5–S7, where the slope and intercept can be used to calculate the breakdown voltage E_0 . The errors induced from the linear fitting to the slope β and the intercept $b = \beta \ln E_0$ has been considered in the following calculation of the breakdown voltage.

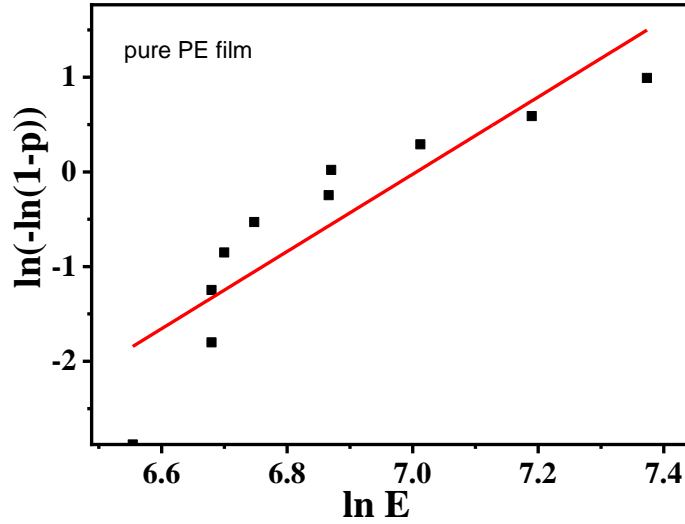


Figure S5. Linear fitting of $\ln[-\ln(1-P)]$ versus $\ln E$ of pure PE film. (The slope is 4.08 ± 0.73 , the intercept is -28.58 ± 5.01 and the corresponding R-square value is 77.06%).

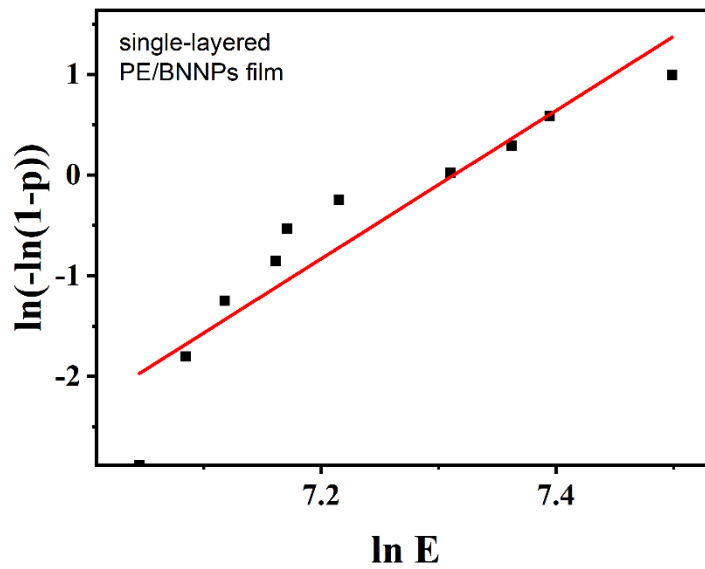


Figure S6. Linear fitting of $\ln[-\ln(1-P)]$ versus $\ln E$ of single-layered PE/BNNPs film. (The slope is 7.36 ± 1.01 , the intercept is -53.82 ± 7.21 and the corresponding R-square value is 85.61%).

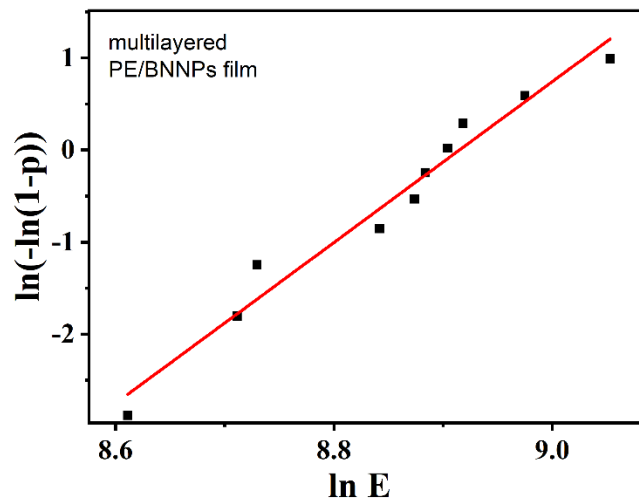


Figure S7. Linear fitting of $\ln[-\ln(1-P)]$ versus $\ln E$ of multilayered PE/BNNPs film. (The slope is 8.73 ± 0.56 , the intercept is -77.83 ± 4.98 and the corresponding R-square value is 96.39%).