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# Polyimide Film with Low Thermal Expansion and High Transparency by Self-enhancement of Polyimide/SiC Nanofiber net

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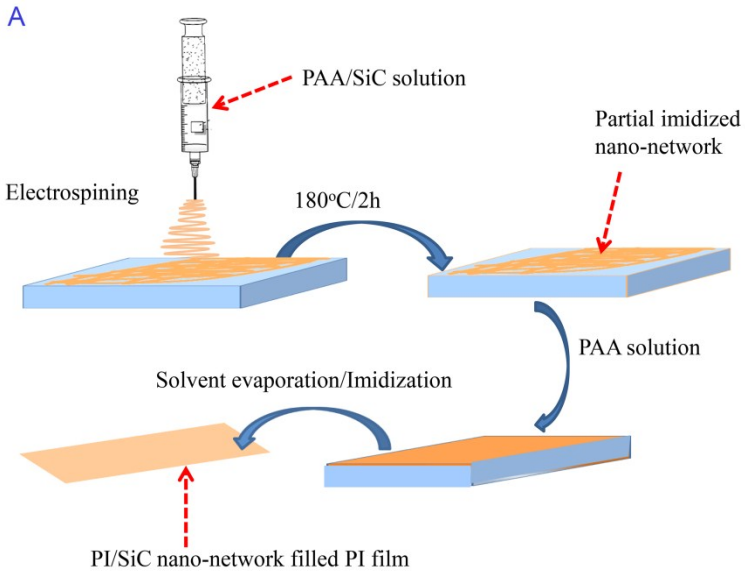


Fig. S1. Scheme of PI/SiC nanofibers filled PI film fabrication.

The determination of imidization degree of PAA with temperature

FTIR measurements have been applied to monitor the he imidization reaction of the PI films at different temperature. Fig. S2 shows the changes in the FTIR spectra of BPDA/PDA for different imidization temperatures.

To study the imidization kinetics of PI films, the peak of aromatic ring (C=C) stretching around 1510 $cm^{-1}$ is chosen as a reference and the peak height method is adopted to calculate the amount of the appearing imide groups formed. The degree of imidization is defined by comparing the intensity of an imide absorption peak normalized to the intensity of the C=C reference band and is given by [16]:

$$(\text{Degree of imidization})_T = (A_{1510}/A_{1780})_T/(A_{1510}/A_{1780})_0$$

Where $A_{1510}$ is the peak height of the C=C reference band at 1510 $cm^{-1}$and $A_{1780}$ is the imide peak height AT1780 $cm^{-1}$ in this study. Subscripts 0 and T indicate the reaction at the initial and a given imidization temperature , respectively.

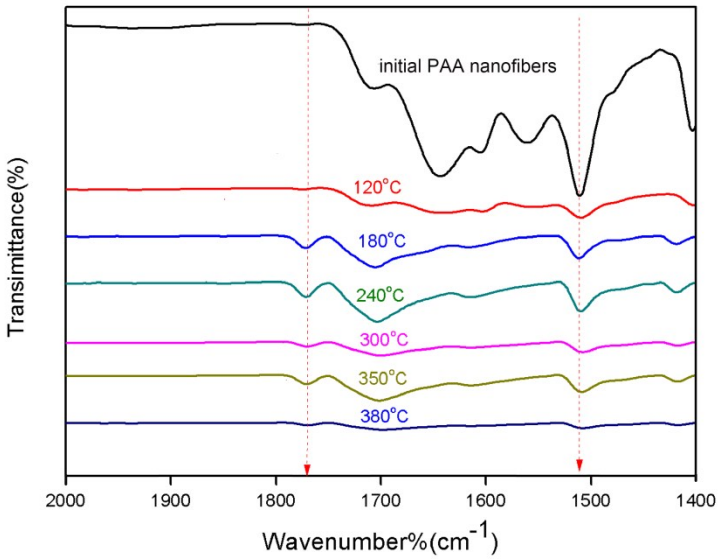


Fig. S2. FTIR spectra of PAA nanofibers at different temperature

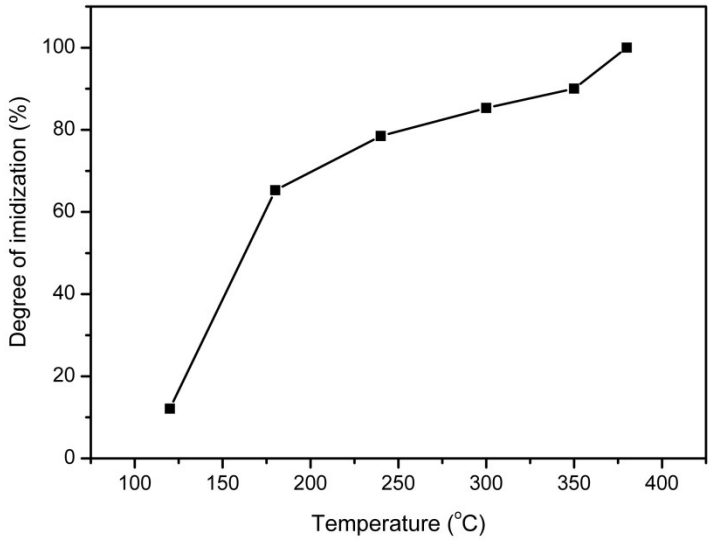


Fig. S3. Degree of the imidization reaction for the main absorption bands of the PAA nanofibers versus the imidization temperature.