

Exploration on effect of thermal cycling treatment on mechanical and tribological performance of polyimide composites

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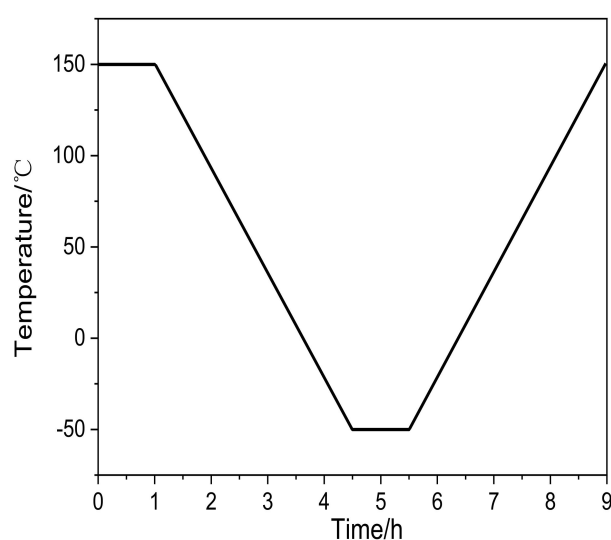


Figure S1 Thermal cycling treatment procedure

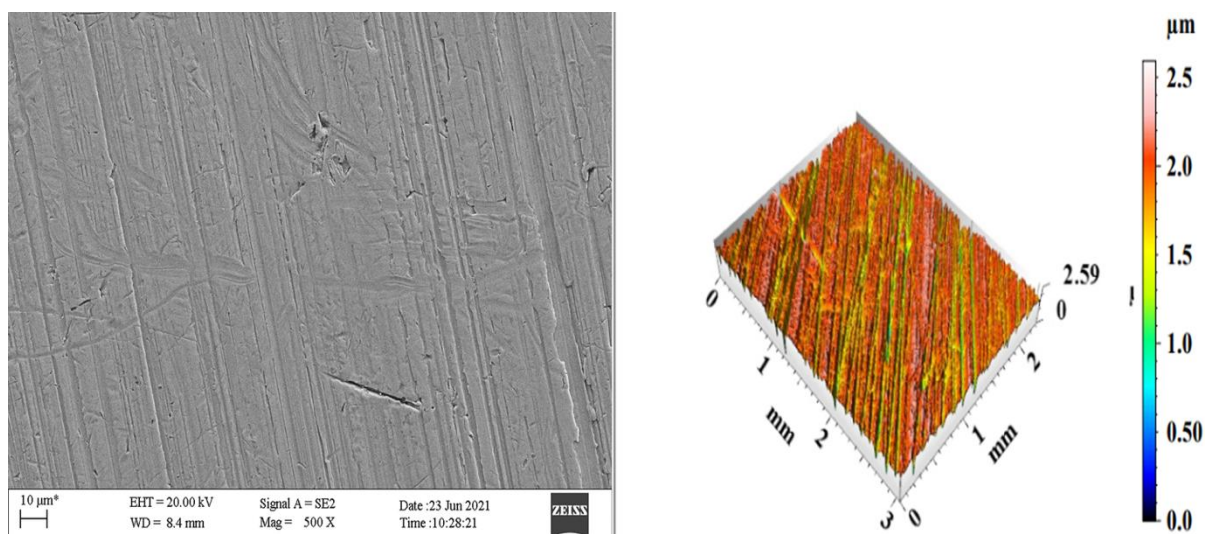


Figure S2 Scanning electron microscopes (SEM) and 3D profile images of unworn steel ring

The relaxation of polymer chain can be demonstrated by the stress variation as a functional of temperature for PI sample in Figure S3. Clearly, after TC treatment PI shows lower stress compared to that before TC treatment.

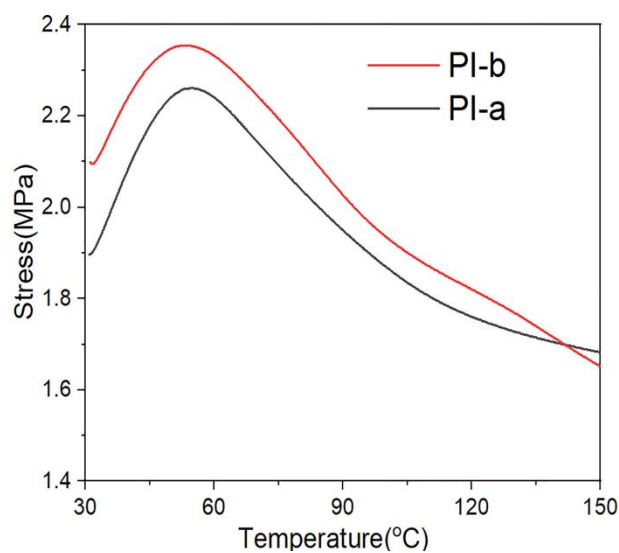


Figure S3 Dynamic thermal mechanical properties of PI, PIA and PIG (-a means after treatment, -b means before treatment)

The inner stress caused by the interaction of polymer chains also can be demonstrated by the absorption of the UV-vis spectra in Figure S4. The higher value of wavelength (λ) for PI before TC treatment suggested the presence of stronger physical interactions, leading to more physical crosslink points in the polymer networks.

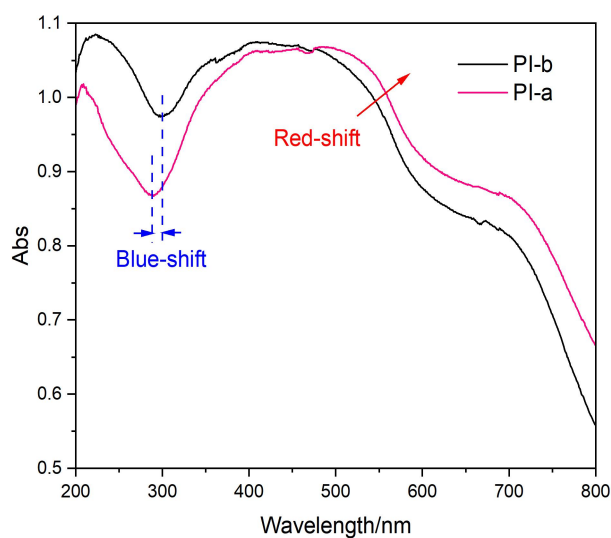


Figure S4 UV-visible absorption curve of PI (-b means before TC treatment, -a means after TC treatment)

The DSC curves in Figure S5 also show the unchanged of the degree of crystallization for PI and PI composites before and after TC treatment.

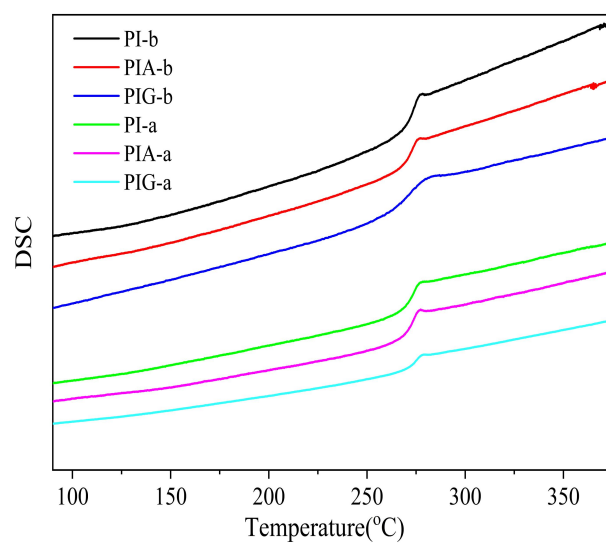


Figure S5 Differential scanning calorimeter (DSC) curves of PI, PIA and PIG (-a means after treatment, -b means before treatment)