

## Novel Thermoplastic Polyimide Composite Materials

Haixia Yang, Jingang Liu, Mian Ji, Lin Fan, Shiyong Yang\*

*Laboratory of Advanced Polymer Materials, Institute of Chemistry, Chinese Academy of Sciences,  
Beijing 100190, China*

Novel thermoplastic polyimide (TPI) resins with designed polymer backbones and controlled molecular weights have been synthesized by thermal polycondensation of aromatic dianhydrides and aromatic diamines in presence of endcapping agent. The TPI resins were reinforced with carbon fiber (CF), glass fiber (GF), or modified by adding of solid lubricants such as graphite (Cr), poly(tetrafluoroethylene) (PTFE) or molybdenum disulfide (MoS<sub>2</sub>) to give TPI molding particulates, which could be injection-molded at elevated temperature to give the TPI composite materials. Thus, thin-walled molded parts could be fabricated. The thermal and mechanical properties of the pure TPI resin, the molding particulates and the molded composites were systematically characterized. Experimental results demonstrated that the TPI molding particulates showed excellent melt processibility to produce high quality TPI composite materials, which has excellent combination of thermal and mechanical properties.

**Keywords** Thermoplastic polyimide; Composite materials; Melt processability; Mechanical property; Injection molding

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