

A tri-branched Phenylethynyl-terminated aryl ether ketone oligomer used as reactive diluent for PETI-5

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ABSTRACT

A new tri-branched, phenylethynyl-terminated aryl ether oligomer (Tri-PE-PAEK) which possesses low melt low melt temperature (252 °C) and low melt viscosity as low as 0.1 poise at 280 °C and/or high solubility before cure were successfully prepared in our previously study. The cured polymer demonstrated excellent thermal stability, high glass transition temperature (T_g) and high modulus. This indicated that it is a good candidate material to processing techniques such as resin infusion (RIM) and/or resin transfer molding (RTM) which are attractive methodologies for the economical manufacture of polymer matrix/carbon fiber composites. In this study, this oligomer had been used as a reactive diluent to PETI-5, reducing the viscosity and lower the minimum temperature of minimum viscosity. The properties of the blendings were characterized by DSC, DMA, TGA, et. Also, toughness of PETI-5 cured resin was very greatly increased by the addition of just 10% Tri-PE-PAEK oligomer into PETI-5. Further loading levels of Tri-PE-PAEK in the blendings led to higher storage modulus and higher mechanical strength without compromising the thermal stability.