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Title:	Enhanced visco-elastic and rheological behavior of epoxy composites reinforced with polyimide nanofiber
Authors:	Harikrishnan, R. (/jspui/browse?type=author&value=Harikrishnan%2C+R.)
Keywords:	Polyimides Polymer nanofiber Electrospinning Rheology
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Abstract:	<p>High performance epoxy composites are now a days a must in several industrial applications. In the present work electrospun polyimide (PI) nanofibers with excellent thermal and mechanical properties was used as a reinforcement in epoxy matrix via a simple mechanical mixing followed by thermal curing method. Well defined electrospun nanofibers of aromatic polyimide (PI) were successfully prepared from electrospinning Poly (amic acid) (PAA) and subsequent thermal treatment. The fiber morphology was analyzed using Transmission electron microscopy (TEM) and Atomic force microscopy (AFM). PI/epoxy nanocomposites with different PI loadings were prepared using chopped PI mats. The dynamic mechanical performance of these PI/epoxy composites was investigated to determine the influence of PI fibers in reinforcing the epoxy matrix. The fracture toughness of these composites displayed a note worthy improvement of 20 % at 1 w% loaded samples and the surface of the fractured samples was investigated by Scanning electron microscope. The rheological properties of these systems show a tremendous increase in the storage and loss modulus when compared to neat systems. In addition flow models were employed to model the rheological data and the comparison was made with the experimental data.</p>
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