

Processing and Characterization of Polymer Nanocomposites

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Abstract

Polymer nano composites have been investigated for the past 20 years by many researchers around the world. The mechanical and physical properties have been enhanced by the addition of nano fillers and the service life of the polymer parts has been improved. Applications abound in industrial, automobile, aerospace, space, bioengineering and energy sectors to name a few. More light is to be thrown on the processing, characterization and properties of these materials to understand the pros and cons of these new materials. There are merits and demerits in the processing and usage of these materials. The aim of this lecture is to highlight the various materials namely, nanoclay, graphene, carbon nanofibers and nanotubes, silica nanoparticles, WC nanoparticles, mullite nanoparticles to name a few, the processing aspects and characterization types of nanofillers - 0D, 1D and 2D (spheroids, fibres and flakes) and the nanofiller methods available today. Uniform dispersion and wetting of the nanoparticles in the polymer matrix are important aspects to be addressed. The popular polymer matrix materials will be introduced. To minimize the cost of raw material, certain aspects of recycling plastics will also be discussed to keep manufacturing costs low. Characterization studies will cover metallurgical, mechanical, thermal, chemical, environmental aspects to name a few. Aspects like dimensional stability and high temperature stability will also be addressed.

Biography

Dr.B.Viswanath completed his B.E. (Mech.Engg.) from CIT (Coimbatore Institute of Technology, Coimbatore), M.E. (Production Engineering) from PSG College of Technology and Ph.D in the area of Surface Engineering, from Anna University, Chennai. He has worked both in the Public and Private Sector companies for 15 years in various capacities as Design Engineer, Project Engineer and PPC Manager. He has an academic experience of 20 years, during which he has worked in reputed Institutes in Tamil Nadu. Currently, he is working as Professor in the department of Mechanical Engineering, New Horizon College of Engineering, Bangalore.He has to his credit, around 50 publications in both journals and conferences. He is a life member of Institution of Engineers, ISTE and The Tribology Society of India. He has received R&D Grants from Govt. agencies for setting up labs and continuing Research. He is a reviewer of many scopus indexed journals.

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