

Mechanical Properties of Fumed Silica/Epoxy Nanocomposite

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Abstract : The addition of nanoparticles has proven to exhibit a high potential for significantly improving mechanical properties of polymers. This paper aims at the manufacturing and characterization of nanocomposites based on epoxy resin modified with fumed silica nanoparticles. The particles were dispersed into epoxy resin with mechanical mixing and ultrasonic instrument which gave a very well-dispersed phase of nanosilica particles. The resulting degree of dispersion and the interfacial adhesion were investigated by scanning electronic microscopy SEM. Such fumed silica was suspended in an epoxy resin and their rheological properties were measured. Uniaxial Tensile tests under quasi-static and impact conditions performed to evaluate some mechanical characteristics (stress-strain curves, Young's modulus, yield stress, strain at rupture) of the nanocomposite.

Keywords : Epoxy, fumed silica, nanocomposite, dispersion of nanoparticles.