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Effect of Nanofillers on the Mechanical Properties of Epoxy Nanocomposites

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Abstract:

In this research, various types of nanofillers were prepared to investigate the impact of nanofillers on the mechanical properties of the epoxy matrix. Tensile testing, dynamic mechanical analysis (DMA) and scanning electron microscopy (SEM) have been used to compare the efficacy of four distinct nanofillers: MXene, graphene (GNP), carbon nanotubes (CNTs) and halloysite nanotubes (HNTs). Final results indicate that MXene/epoxy nanocomposite lead to a significantly improved tensile strength and elastic modulus of up to 66.57% and 22.65%, respectively, compared to neat epoxy. The homogenous dispersion, size and shape of nanoparticles are the major elements that contribute to the final properties of the nanocomposites.