

POLYMER NANOCOMPOSITE: TO BRIDGE THE GAP BETWEEN CERAMICS AND POLYMERS

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Keywords: *Polymer Nanocomposite; Mechanical Property; Carbon Nanotube; Graphene; Nanoparticle; Hierarchical Structure*

1 General Introduction

“Nanocomposite materials have the potential to bridge the gap between ceramics and polymers” - This is one of the expectations one decade ago in composites community. However, so far “with the exception of reinforced elastomers, nanocomposites have not lived up to these expectations.....”

In this talk, the state-of-the-art in polymer nanocomposites will be reviewed. Some challenges ahead will be discussed. The progresses based on our recent researches which showed some potential to fill these gaps will be further introduced, such as creep resistant thermoplastic nanocomposites, super-scratch resistant transparent polymer coatings with nanoparticles, and epoxy with highly filled nanoparticles. Some updated results of hierarchically structured nanocomposites based on carbon nanotubes and graphenes will be carried out as well. It is one of the key issues that the mechanical performance of polymer nanocomposites can be manipulated where the nanoscale clusters and their surrounding polymer chains are interacted.