

## Surface Activation of Carbon Nanotubes Generating a Chemical Interaction in Epoxy Nanocomposite

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**Abstract :** Carbon nanotubes (CNTs) are known for having high elastic properties with high surface area that promote them as good candidates for reinforcing polymeric matrices. In composite materials, CNTs lack chemical bonding with the surrounding matrix which decreases the possibility of better stress transfer between the components. In this work, a chemical treatment for activating the surface of the multi-wall carbon nanotubes (MWCNT) was applied and the effect of this functionalization on the elastic properties of the epoxy nanocomposites was studied. Functional amino-groups were added to the surface of the CNTs and it was evaluated to be about 34% of the total weight of the CNTs. Elastic modulus was found to increase by about 40% of the neat epoxy resin at CNTs' weight fraction of 0.5%. The elastic modulus was found to decrease after reaching a certain concentration of CNTs which was found to be 1% wt. The scanning electron microscopic pictures showed the effect of the CNTs on the crack propagation through the sample by forming stress concentrated spots at the nanocomposite samples.

**Keywords :** carbon nanotubes functionalization, crack propagation, elastic modulus, epoxy nanocomposites

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