

# Functionalization of carbon nanotubes and mechanical characterization of bio-based epoxy nano-composites

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## ABSTRACT

Chemical functionalization of multi walled carbon nanotubes (MWCNTs) is important from the view point of polymer based composite manufacturing. As pristine MWCNTs has certain disadvantage such as they have lower dispersion, they are hydrophobic and are not readily soluble in a solvent, such characteristics makes them unreliable candidate for most of the industrial applications. By doing chemical functionalization of MWCNTs [1], [2], these shortcomings can be overcome, and the MWCNTs can be used as a filler in composite manufacturing. This has the advantage of better nanofillers' dispersion and provide the better interfacial bonding.

In this study, MWCNTs are functionalized by the carboxylic group, chemical functionalization of MWCNT's is an optimization problem, governed by parameters like mixture acid concentration, temperature, time of heating and amount of MWCNTs used. Material characterization of MWCNTs is done and test specimens are manufactured according to different concentrations of MWCNTs within a bio-based epoxy resin. Mechanical properties are then compared according to different concentrations. These mechanical and material characterizations increase the understanding of chemical functionalization by carboxylic group and the influence of the concentration of MWCNTs dispersed within the bio-based resin matrix.

## -REFERENCES

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