

DEVELOPMENT OF TECHNOLOGY CARBON NANOTUBES REINFORCED POLYMER NANOCOMPOSITES AS STRUCTURAL MATERIALS FOR APPLICATIONS IN HARD-TO-DETECT DRONES

ABSTRACT

This study describes research on the synthesis of functionalized carbon nanotubes containing amino groups and their application in epoxy composites. Structural studies of multi-walled carbon nanotubes before and after the functionalization process were conducted. Subsequently, the dispersion of functionalized carbon nanotubes in an epoxy matrix and their influence on electrical and mechanical properties as well as shielding effectiveness in the range of 4-18 GHz of epoxy composites were investigated. The addition of multi-walled nanotubes with specific mass fractions made it possible to obtain an electrically conductive material with a simultaneous strengthening of the polymer structure and improvement of selected mechanical parameters. However, high amounts of nanofillers resulted in a drastic deterioration of properties. Along with obtaining the percolation threshold, the prepared composites showed the ability to shield electromagnetic waves in the 4-18 GHz range, which means that the material developed has an application potential in stealth technologies.