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Correlation between Oxidation Degree and Mechanical Properties in Graphene Oxide: A Comprehensive Analysis

Two-dimensional materials, such as graphene, have acquired significant attention due to their unique electrical, optical, and mechanical properties, making them highly promising for various applications including electronics, optoelectronics, and energy storage. This study focuses on graphene oxide (GO) samples with varying degrees of oxidation, synthesized using a modified Hummers' method. These samples were investigated using force-displacement curve indentations with an MFP3D-SA Atomic Force Microscope (AFM). The study establishes a correlation between the mechanical response and the degree of oxidation, highlighting potential applications based on mechanical performance. Characterization techniques including Thermogravimetric Analysis (TGA), X-ray Photoelectron Spectroscopy (XPS), Raman Spectroscopy, Scanning Electron Microscopy (SEM), and AFM were employed to link the type and quantity of functional groups.

Keywords

Graphene oxide, Mechanical properties, Atomic Force Microscopy, Material characterization

Reference

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Author approval

I confirm

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