Antimicrobial activity of Graphene Oxide/Silver nanocomposite obtained by Electron Beam

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Graphene oxide is a carbon-based nano material that has a high specific surface area, high chemical stability, excellent electrical and thermal conductivities, high mechanical resistance, the oxygen groups facilitate dispersion in polar solvents and its functionalization. In the literature, is described several methods of metal incorporation on graphene oxide surface using toxic reagents or with long periods of reaction. The objective of this work is to develop an innovative and sustainable method of incorporating silver into graphene oxide that does not involve toxic reagents or generated residues. in a short reaction time at room temperature beyond the use of the as an alternative process to the chemical processes traditional. A silver solution in the complex form was added to a dispersed graphene oxide in water/isopropanol solution. The mixture wassubmitted to a dose of radiation ranged from 150 to 400 KGy using a electron beam acelerator. The nanocomposite GO/Ag characterization was performed by thermogravimetry analysis (TGA), X-ray diffraction (XDR), scanning transmission electron microscope coupled to the energy dispersive X-ray spectrometry (TEM/EDS). The antimicrobial activity of GO/Ag was observed by *Escherichia coli,* a Gram negative bacterium and *Bacillus subtilis* a Gram positive bacterium in solid culture medium. The minimum inhibitory concentration of GO/Ag was 50 mg/L. .It is noteworthy that the incorporation of silver occurred at the same time the reduction of graphene oxide without the generation of toxic chemical residues.

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