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Properties of silver doped carbon biomaterial prepared by thermionic vacuum arc method

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Studies have shown that carbon thin films, having good biocompatibility, are suitable as surface coatings on biomedical devices, including bone implants and cardiovascular devices. Doping of carbon with selective elements is an attractive method to enhance the biological and other properties of the thin film. Silver (Ag) is known to be a potent antibacterial agent that has been used in biomedical engineering with good effects. In this work, Silver was chosen as the dopant because of its anti-bacterial properties. Silver carbon nanoparticles were deposited on glass and silicon substrates by Thermionic Vacuum Arc (TVA) method in one electron gun configuration. As the chemical interactions between Ag and C generally are very weak and the interactions between the used transition metals and C are strong, it was expected that Ag to form a separate phase. This was observed as the nanocomposite films were consisting of Ag grains embedded in a nanocrystalline or nanocomposite matrix. The effects of silver on the carbon matrix surface morphology and wettability were investigated by using: Scanning Electron Microscopy (SEM) and Free Surface Energy (FSE) by See System. From the TEM measurements we obtained 6.85 nm for Ag nanoparticle and 159.61 nm for carbon and the Free Surface Energy proved a hydrophobic character for the CAg thin film.

Biography

Virginia Dinca-Balan has completed her PhD from Bucharest University, Romania. She is the Assistant Professor Doctor of Biophysics and Medical Physics at Ovidius University of Constanta, Romania. She has published more than 22 papers in reputed international journals and three chapters in books.

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