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GRAPHENE/DNA NANOSTRUCTURED FILMS FOR BIOINSPIRED SENSING OF UV RADIATION
EFFECTS

Abstract

Bio-based sensor nanotechnology is a fast growing field that can provide efficient solutions to monitor radiation effects in space environment. In our research we investigate the integration of UV-sensitive biological recognition elements, such as DNA, in carbon-based hybrid nanomaterials for the fabrication of miniaturized and light-weight sensors that can be used to monitor the biological effects of hostile ultraviolet radiation in space. In particular, in this paper we present results on the fabrication and characterization of hybrid nanostructured films containing graphene material and DNA strands for an in-situ and real time detection of UV radiation damaging effects from changes of the nanofilm electrical properties. The biosensing graphene/DNA units are embedded in a UV-transparent polymeric matrix based on silicon polymers, which allows for the fabrication of flexible films with high thermal stability.