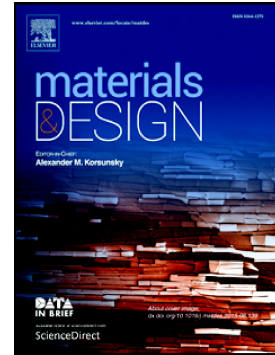


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INFLUENCE OF THE ELECTROPHORETIC DEPOSITION PARAMETERS ON THE FORMATION OF SUSPENDED GRAPHENE-BASED FILMS

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Abstract

In this paper we report on the one step formation of suspended graphene-based films, at micrometer scale, by electrophoretic deposition technology (EPD) starting from graphene oxide (GO) water suspensions and isolated graphite fibers as conductive support. The influence of experimental parameters, such as the concentration of GO, the voltage applied and the deposition time on the morphology, size, structure and chemical composition of these films has been thoroughly investigated by means of SEM, HRTEM/EDAX and Raman measurements. A minimum electrical field is required to conduct the charged particles in suspension to the corresponding electrode and to contribute to the formation of the film, starting from preferential points, via the deoxygenation of the GO layers. Moreover, the deposition time can be adjusted to alter the size of the produced films and their degree of reduction. These results contribute to a better understanding of the mechanism of formation of these films and, consequently, which will facilitate the fabrication of optimized graphene-based nanostructures for different applications.

Keywords: electrophoretic deposition, graphene oxide, graphene film, graphite felt.

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