

Graphene oxide: from fundamentals to applications

Luca Ottaviano

Dipartimento di Scienze Fisiche e Chimiche Università dell'Aquila

In this review, we discuss the fundamental characterization of graphene oxide (GO) and its future application perspectives. Morphology is discussed through optical microscopy, fluorescence microscopy, scanning electron microscopy, and atomic force microscopy studies. Chemical, structural, and vibrational properties are discussed through x-ray photoemission spectroscopy and Raman spectroscopy studies. Two easy characterization strategies, based on the correlation between x-ray photoemission spectroscopy and contact angle/optical contrast measurements are reported. Sensing and nano-biotechnology applications are discussed with focus on practical gas sensing and optical sensing, on the one hand, and on the toxicity issue of GO, on the other hand. Synthesis and post-synthesis treatments are also discussed, these latter with emphasis on lithography.

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