Photoelectrochemistry: a tool for the study of charge transfer at interfaces with carbon nanostructured materials.

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Photoelectrochemistry of nanomaterials is commonly employed in fields related to energy and environmental applications, such as water splitting, solar cells or water remediation. It is a valuable technique for the direct evaluation of the performance for the desired application. In addition, it can be used for the study of intrinsic electronic properties of nanostructured of a great variety of semiconductor materials, such as conductive polymers or metal oxide nanoparticles. It is also a highly valuable implement to assess charge and/or energy transfer phenomena between the mentioned semiconductors and carbon nanomaterials (GO, CNTs), unveiling their role as charge acceptors/donors, blockers/transporters, sensitizers/conditioners, or even as electroactive materials for themselves, thus allowing the tuning of optoelectronic properties of composite materials. This versatility makes photoelectrochemistry a key tool in the field of carbon nanoscience and nanotechnology [1-4].

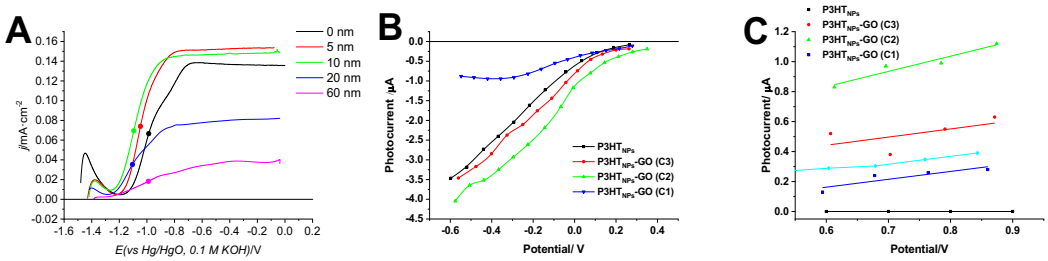

***Figure 1**. Photoelectrochemical properties of TiO_2/electrochemically reduced GO (A) and P3HT/GO composites in the photocathodic (B) and photoanodic (C) branch.*

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