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Graphene Materials for Efficient Hybrid Solar Cells: A Spectroscopic Investigation

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Abstract : Nowadays, graphene and its composites are universally known as promising materials. They show their potential in a large field of applications including photovoltaics. This study reports on the role of nanohybrids and nanosystems known as strong light harvesters in the efficiency of graphene hybrid solar cells. Our system included Graphene/ZnO/Porphyrin/P3HT layers. Moreover, the physical properties including surface/interface, optical and vibrational properties were also studied. Our investigations confirmed the interaction between the different components as well as the sensitivity of their photonics to the synthesis conditions. Remarkable energy and charge transfer were detected and deeply investigated. Hence, the optimization of the conditions will lead to the fabrication of higher conversion efficiency in graphene solar cells.

Keywords : graphene, optoelectronics, nanohybrids, solar cells
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