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Low cost solar cell based on graphene and perovskite delivers an efficiency of 15.6 percent

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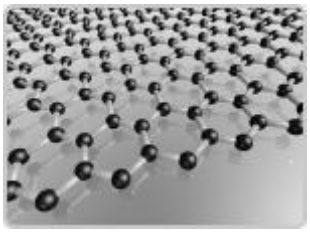

The Group of Photovoltaic and Optoelectronic Devices (DFO) at the Universitat Jaume I in Castelló, Spain together with researchers from the University of Oxford, have created solar cell based on graphene and perovskite that delivers an efficiency of 15.6%.

The high efficiency photovoltaic device, can be manufactured at low temperatures, is based on a combination of titanium oxide and graphene as the charge collector and perovskite as the sunlight absorber.

The results of the research study have been published in Nano Letters reveals details of the scientific work that combines new and promising materials based on a perovskite structure, which absorb sunlight efficiently, with graphene.

The researchers, led by the professor of Applied Physics Juan Bisquert, report a solar cell with graphene that has an efficiency of 15.6% which exceeds that obtained by combining graphene with silicon. The researchers are hailing the development as a new milestone for the progress of perovskite solar cells.

The researchers Eva Barea, Iván Mora and Juan Bisquert explained that the new device consists of several layers processed at temperatures below 150°C. The high efficiency device can be manufactured at low temperatures to facilitate large-scale manufacturing which will lower production costs and raises the possibility of using devices based on flexible plastics.

Reference: Low-temperature processed electron collection layers of Graphene/TiO2 nanocomposites in thin film perovskite solar cells (December 16, 2013 DOI: 10.1021/nl403997a) http://pubs.acs.org/doi/abs/10.1021/nl403997a