(One page abstract format: including figures and references. Please follow the model below.)

Interface Engineering of CVD Graphene in photovoltaic devices

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Abstract (Arial 10)

The major efforts in solar energy research are currently directed at developing cost-effective systems for energy conversion and storage. Recently, in view of its fascinating physical properties, the integration of graphene into photovoltaic devices has been extensively explored. Many are excited about the transparency and conductivity of graphene films, however the ultimate performance of graphene in solar cells may be limited by other factors. First, the interfacial energy offset between graphene and the photoactive materials has to be tuned in order to optimize charge transfer. Second, the planarity and hydrophilic character of graphene has to be improved to allow for spin-coating with hole-transporting layers such as poly(3,4-ethylenedioythiophene):poly(styrenesulfonate) (PEDOT:PSS). Third, the preparation of the graphene films has to be improved in terms of achieving large grain crystal growth, as well as reducing contaminations from organic residues in the transfer process. This underscores the difficulty in optimizing any factors in the fabrication of the solar cell devices. It is timely to investigate the interface engineering of graphene in the context of high-performance solar cells. In the works, we carry out a systematic study of the different modification methods for the graphene interfaces with the aim of optimizing its role as an electrode of solar cell.

References

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Figures