Novel PMMA Method for Graphene Transfer to Perovskite-based Solar Cells

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Perovskite solar cells are highly efficient at converting light into electricity, but they rely on carrier transporting materials to transport positively charged quasiparticles called "holes". Such charge-carriers are often prohibitively expensive. In addition, perovskite thin films are easily hydrolyzed and decompose in humid environments. A material called graphene has recently been demonstrated to successfully address these concerns; it is transparent and a good conductor which also acts as an efficient charge-carrier and a hydrophobic stabilizer against humid air. However, since graphene is a 2-D layer, it is very difficult to transfer successfully onto the perovskite surface. Current methods including dry transfers or gel film transfers, both of which can result in cracks and impurities in the graphene layer.
Researchers at Purdue University have developed a novel PMMA transfer method of graphene to perovskite which both improves the homogeneity of the transferred graphene film and allows for larger areas of graphene to be successfully transferred. More perfect graphene coatings allow the treated solar cells to experience improved electronic performance and reduced degradation.

Advantages:
-Improved electronic performance
-Reduced degradation

Potential Applications:
-More efficient, lower cost solar cells

People:
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Intellectual Property:

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