In Situ Thermal Annealing Device

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Categories:
- Chemistry and Chemical Analysis
- Micro & Nanotechnologies

Keywords:
- Chemistry and Chemical Analysis
- Graphene
- Micro & Nanoelectronics
- Photovoltaics
- Surface Chemistry
- Thin Films

Controlling surface chemistry of layered materials, such as graphene, is central to their integration into hybrid materials for applications ranging from nanoelectronics to photovoltaics. A significant challenge in functionalizing such materials is that the monolayers must be constructed through relatively weak noncovalent interactions to avoid disrupting the extended electronic structure in the graphene or other layered material, which is frequently central to the desired function. Thus, creating films with extended order and minimal defects is often challenging.

Researchers at Purdue University have developed a device that enables control over substrate temperature prior to and during the transfer of molecular monolayers and other thin films using Langmuir-Schaefer techniques. This device dramatically increases the length scale and quality of ordering within the film.

Advantages:
-Provides temperature control during transfer of substrates
-Increases the length scale and quality of ordering within the film
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Potential Applications:
-Transfer of thin films to hydrophobic materials such as graphene
-Transfer of lipid monolayers and bilayers for biological applications
-Classes of materials relevant to organic photovoltaics or nanoelectronics
-Integrates into commercial laboratory Langmuir troughs or larger scale industrial processes

People:
- Claridge, Shelley A (Project leader)

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Intellectual Property:

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