

平成25年9月7日

第4回 ナノカーボンセミナーのお知らせ

下記により総合研究機構ナノカーボン研究部門主催のセミナーを開催しますので、奮ってご参加ください。

日時：平成25年9月25日(水) 16:30~17:30

場所：神楽坂キャンパス 2号館 3階234教室

講師： Dr. Avetik R. Harutyunyan

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題目： Exploitation of Carbon Nanotube and Graphene Intrinsic Properties for Unprecedented Applications

要旨：

The advance of nanomaterials has opened new opportunities for applications owing to their high surface-to-volume ratio. Indeed, graphene and its one dimensional counterpart, the carbon nanotube, continue to surprise with unprecedented applications [1-3]. Ironically high surface area also is easily compromised by various unintentional contaminants that lead to the performance volatility in electronic devices [4] and to the limitation as a sensing material [1, 2]. Fortunately, as will be shown, the proper treatment of their surfaces, for instance by continues UV-light irradiation, allows remove adsorbed contaminations and exploit superior intrinsic sensitivity of carbon nanotubes and graphene to the detection of various vital molecules and reach a detection limit as sensitive as of 158 parts-per-quadrillion (p.p.q.). Another explicit feature 2D system is that strictly it thermodynamically unstable and can exist only through the perturbations in the third direction that are the one of the reasons of a wrinkled topography of graphene sheet surface. It appears that the peculiarity of graphene surface topography can be exploited as an atomically thin interface to intermedate the growth of vertically aligned carbon nanotubes (forest) even on the conductive surfaces such as Cu and Pt. Noticeable, that growth of forest on diamond surface lead to the formation of unique hybrid of three carbon allotropes, an advance that holds great potential for thermal management. Details of the sensing mechanisms and the graphene intermediated carbon nanotube forest growth will be discussed.

1. G. Chen et al., Sci. Reports 2:343/DOI:10.1038/srep00343 (2012)
2. G. Chen et al., Appl. Phys. Lett. 101, 053119 (2012)
3. R. Rao et al., Sci. Reports 3:1891/DOI/10.1038/srep01891 (2013)
4. G. Chen et al., Appl. Phys. Lett. 95, 123118 (2009)

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