Internal Seminar

Graphene/h-BN hybrid Structures for Improved Oxygen Reduction Reaction Activity

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Designing new materials that efficiently act as electrocatalysts for oxygen reduction reaction (ORR) is significantly desirable in various disciplines such as energy conversion, material dissolution or biology. Role of ORR catalysts in fuel cells or metal-air batteries is in forefront and there is a severe need to replace scarce noble metal-based benchmarked catalysts from energy technologies. In this perspective, two dimensional (2D) layered nanomaterials (TMDs, graphene, h-BN and etc.) have been in the research forefront due to the exceptional high surface area which will be beneficial for catalysis. In particular, h-BN termed as "white graphene" is recently emerging as robust electrocatalyst material for ORR and HER. Although h-BN is an insulating material, it has been reported that it can behave as an efficient electrocatalyst when supported on metal electrodes due to metal/h-BN interaction. Similarly, tailoring the band gap of h-BN will also affect its electronics and catalytic properties. In this talk, I will present some of the results from my work giving clarity to the role of engineering the h-BN structure and how they may behave as ORR electrocatalyst. I will also briefly talk about the other possibilities of developing the efficient metal free electrocatalyst based on 2D nanomaterials for energy applications.

Monday, Jun 11th 2018

2:30 PM (Tea/Coffee at 2:00 PM)

Seminar Hall, TIFR-H