



PHYSIKALISCHES KOLLOQUIUM

Mittwoch, 15.01.2014, um 17:15 Uhr

Ort: Reichenhainer Str. 90; Neues Hörsaalgebäude, Raum: 2/N013



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Playing Lego with graphene

Even since the Mayans first used clays to make dyes, mankind has made use of layered materials. Over the past two centuries this effort is mirrored in scientific research leading to experiments to exfoliate into one- or few-atom thick sheets or to intercalate them with atoms and (macro)molecules, as well as to an elucidation of their laminar structure and peculiar properties. Currently we live in an era of enormous interest in the manipulation of two-dimensional materials following the discovery of graphene. In this presentation I shall start by illustrating various aspects of the exfoliation of pure and oxidized graphite. Then I shall discuss the deposition by a modified Langmuir Blodgett technique of graphene oxide and of graphene on a variety of substrates with a coverage that can be varied as desired from isolated sheets to a densely packed 2D arrangement. From there I shall pass on to pillared structures, for example of graphene oxide and carbon nanotubes, build up by the same modified Langmuir Blodgett technique in a layer-by-layer fashion. Finally I shall discuss pillared structures achieved by intercalation and in particular report on experimental and theoretical studies of the intercalation mechanism of polycyclic aromatic molecules into graphite oxide. Two representative molecules of this family, aniline and naphthalene amine behave very differently after intercalation, namely aniline molecules prefer to covalently bind to the graphene oxide matrix via chemical grafting, while naphthalene amine molecules bind with the graphene oxide surface through π - π interactions. This new understanding opens new perspectives for the interaction of various aromatic molecules with graphite oxide and the so-called "intercalation chemistry".

Alle Zuhörer sind ab 17:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.