

Seminář odd. 26

Tenkých vrstev a nanostruktur

Fyzikální ústav AVČR, Cukrovarnická 10, Praha 6

datum: 18. 10. 2016 úterý

čas: 10:00

mítnost: knihovna, budova A, 1.p.

TÉMA

With 2D layers to new compound materials

Thomas Michely

II. Physikalisches Institut, Universität zu Köln, Germany

2D-layers, like graphene or a monolayer of hexagonal boron nitride (h-BN), enable the creation of new materials, unforeseen reaction pathways or striking confinement effects. Three examples for this statement are given. (i) Room temperature deposition on a 2D-layer moiré with an Ir(111) substrate results in the formation of a regular array of clusters with a narrow size distribution and high thermal stability. Such arrays may be of great use for applications in nanocatalysis and nanomagnetism. Here we will specifically discuss the formation of a novel carbon cluster / graphene compound. (ii) The inertness of 2D-layers together with the confinement of the diffusion for the supplied reactands to two dimensions enables new reaction pathways in organo-metallic chemistry. As an example, it is shown how graphene and h-BN enable the growth of Europium- cyclooctatetraene nanowires of micrometer length through supply of atomic Eu and cyclooctatetraene molecules under well-defined ultrahigh vacuum conditions. (iii) Using ion implantation and thermal processing highly pressurized precipitates of the implanted species can be created in the space between a 2D-layer and its substrate. Thereby new high temperature and high pressure reactions might come into reach. As an example for the high pressure in these precipitates, we demonstrate crystalline Xe underneath h-BN on Ir(111).

Contributions to this work by H. Åhlgren, M.A. Arman, N. Atodiresei, S. Blügel, C. Busse, V. Caciuc, F. Craes, T. Gerber, E. Granas, C. Herbig, F. Huttmann, W. Jolie, J. Knudsen, T. Knispel, J. Kotakoski, A.K. Krashennnikov, A.J. Martinez-Galera, A. N'Diaye, N. Schleheck, U.A Schröder, S. Schumacher, S. Simon, and P. Valerius are gratefully acknowledged.

odborný garant: *Ing. Pavel Jelínek, Ph.D.*