chemisch
physikalische
gesellschaft

Gegründet im Jahre 1869 von H. Hlasiwetz, J. Loschmidt, J. Petzval und J. Stefan

EINLADUNG

zum Vortrag von

Univ.Ass. Dr. Bernhard Bayer-Skoff

Technische Universität Wien, Institut für Materialchemie

Realising scalable synthesis and integration of two-dimensional materials and hybrids

am Dienstag, 17. Oktober 2023, um 17:30 Uhr

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,
1090 Wien, Strudlhofgasse 4 / Boltzmanngasse 5, 1. Stock

Barrierefreier Zugang: Boltzmanngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals

Abstract:
Having unique combinations of many exceptional and useful properties, two-dimensional (2D) materials are essentially “transferrable surfaces” with a widespread application profile. Key to realisation of real-world applications of 2D materials is development of scalable synthesis, integration and operation protocols. Such process development however requires understanding of atomistic mechanisms of the physical and chemical processes happening during 2D materials growth, interfacing with other materials into hybrids and environmental interactions under operation. Using advanced in-situ materials characterisation techniques, we develop rational synthesis and integration protocols for various 2D materials incl. graphene, hexagonal Boron-Nitride, transition metal dichalcogenides and pnictogens as well as their hybrids with metals, metal-oxides and organics, down to the controlled single-atom level. Our key techniques for 2D materials synthesis are hereby chemical vapour deposition (CVD) and, since recently, also liquid-phase-exfoliation (LPE). For materials characterisation we in particular employ an unique combination of spectroscopic and diffractive in-situ techniques during realistic synthesis and processing conditions (in-situ near-ambient pressure x-ray photoelectron spectroscopy (XPS) and in-situ x-ray diffractometry (XRD)), coupled with collaborative use of high-resolution (scanning) transmission electron microscopy ((S)TEM). We thereby aim to facilitate scalable, controlled growth of 2D materials and their hybrids towards realisation of a wide range of applications incl. in electronics, sustainable energy and ultimately thin functional coatings. I will introduce in this contribution an overview of our recent and ongoing research activities towards these goals.

CHEMISCH-PHYSIKALISCHE GESELLSCHAFT
c/o Universität Wien, Fakultät für Physik, 1090 Wien, Boltzmanngasse 5, Austria
Generalsekretär: Christl Langstadlinger
Tel.: +43-(0)1-4277/51108 - Mobil: 0664-60277 51108
E-Mail: christl.langstadlinger@univie.ac.at - http://www.cpg.univie.ac.at
ZVR-Zahl: 513907440
Konto: Bank Austria - IBAN: AT22 1100 0086 4440 8000 - BIC: BKAUATWW