



TECHNISCHE UNIVERSITÄT
IN DER KULTURHAUPTSTADT EUROPAS
CHEMNITZ

Institut für Physik Physikalisches Kolloquium



Mittwoch, 28.06.2023, um 11:15 Uhr

Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum C10.013

Prof. Dr. Wilhelm Auwärter
TU München

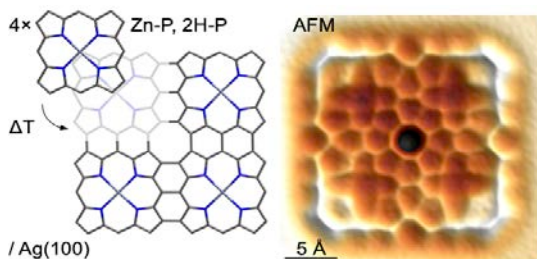


GAEDE-PREISTRÄGER 2015

Molecules on metals: Interface characterization and on-surface reactions for atomically defined nanostructures

Metal single crystals represent versatile supports for the assembly and synthesis of low-dimensional materials, using molecules as precursors or building blocks. Chemical vapor deposition is used for the scalable synthesis of two-dimensional materials, such as hexagonal boron nitride [1], whereas on-surface chemistry protocols provide elegant routes to individual molecular complexes, oligomers, and advanced architectures with distinct properties [2].

In this talk, I will briefly introduce our research on the synthesis of surface supported two-dimensional materials, such as borophene in ultrahigh vacuum [3]. Afterwards, I will focus on the formation of atomically-defined metal-organic structures on coinage metal surfaces by temperature-induced ring-closing reactions. Specifically, distinct oligomers including square-type porphyrin tetramers were achieved on Ag(100) (see Figure) [4]. Furthermore, the synthesis of π -extended oxygen-doped porphyrins via O-annulation on Au(111) will be addressed. Scanning tunnelling microscopy, spectroscopy, and bond-resolved atomic force microscopy (AFM) supported by complementary theoretical modelling were used for a comprehensive interface characterization. These studies thus give access, and insights, to novel molecular nanostructures with distinct properties on metal supports.



- [1] W. Auwärter, *Surf. Sci. Rep.* 74, 1 (2019)
- [2] L. Grill, S. Hecht, *Nat. Chem.* 12, 115 (2020)
- [3] M.G. Cuxart *et al.*, *Sci. Adv.* 7, 45, abk1490 (2021)
- [4] E. Corral Rascon *et al.*, *J. Am. Chem. Soc.* 145, 967 (2023)

Figure: Scheme of dehydrogenative porphine homocoupling to square-type porphyrin tetramer and corresponding AFM image.

Alle Zuhörer sind ab 11:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.



Informationen zum Vortrag erteilt:
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