



Contribution ID: 27

Type: **Talk**

[231] Interfacial Actinide Coordination Chemistry: Bis(porphyrinato)thorium Formation, Rotation, and Characterization

Wednesday, September 1, 2021 5:00 PM (15 minutes)

Actinide-based metal-organic complexes and coordination architectures encompass intriguing properties and functionalities, but are still largely unexplored on surfaces. We report the first in situ synthesis of actinide tetrapyrrole complexes under ultra-high vacuum conditions, both on Ag(111) and *h*-BN/Cu(111) supports. Exposing a tetraphenylporphyrin (TPP) multilayer to an elemental beam of thorium followed by a temperature-programmed reaction and desorption of surplus molecules yields bis(porphyrinato)thorium (ThTPP₂) assemblies. The resulting complexes were characterized by x-ray photoelectron spectroscopy, scanning tunneling microscopy and spectroscopy, temperature-programmed desorption, and complementary density functional theory modeling. Our results give insight into the supramolecular assemblies of ThTPP₂ and highlight the conformational and electronic properties of these double-decker compounds with submolecular precision.

Primary author: RHEINFRANK, Erik (Institute of Applied Physics, TU Wien; Physics Department E20, Technical University of Munich)

Co-authors: PÖRTNER, Mathias (Physics Department E20, Technical University of Munich); NUÑEZ BEYERLE, Maria del Carmen (Physics Department E20, Technical University of Munich); HAAG, Felix (Physics Department E20, Technical University of Munich); DEIMEL, Peter S. (Physics Department E20, Technical University of Munich); ALLEGRETTI, Francesco (Physics Department E20, Technical University of Munich); SEUFERT, Knud (Physics Department E20, Technical University of Munich); BARTH, Johannes V. (Physics Department E20, Technical University of Munich); BOCQUET, Marie-Laure (PASTEUR, Département de Chimie, Ecole Normale Supérieure, PSL University, Sorbonne Université, CNRS); FEULNER, Peter (Physics Department E20, Technical University of Munich); AUWÄRTER, Willi (Physics Department E20, Technical University of Munich)

Presenter: RHEINFRANK, Erik (Institute of Applied Physics, TU Wien; Physics Department E20, Technical University of Munich)

Session Classification: Surfaces, Interfaces and Thin Films

Track Classification: Surfaces, Interfaces and Thin Films