

ON–SURFACE METALATION OF SALOPHENE MOLECULES WITH Dy ON Au(111) SUBSTRATE: A COMBINED STM/STS AND DFT STUDY**T. Grzela¹, B. Pieczyrak², L. Jurczyszyn², M. Bazarnik³**¹ *Institute of Physics, Poznan University of Technology, Poznan, Poland*² *Faculty of Physics and Astronomy, University of Wrocław, Wrocław, Poland*³ *Institute of Physics, Universität Münster, Münster, Germany*

Metal–organic complexes attract significant attention due to their applications in photovoltaics [1], nanoelectronics, and spintronics [2]. To bypass stability issues of traditional wet chemistry, *in situ* on–surface synthesis under ultra–high vacuum (UHV) has emerged as a contamination–free alternative.

Dysprosium (Dy), featuring a large magnetic moment and strong anisotropy, is a key building block for single–molecule magnets (SMMs). While conventional wet chemistry yields Dy–SMMs with complex, non–planar 3D architectures [3], on–surface metalation offers a pathway to constrain these complexes into well–defined, planar configurations. This approach was previously shown to successfully modulate the properties of 5,5′–dibromosalophene via 3d transition metals (Co, Fe, Cr) on Co–intercalated graphene/Ir(111).

Within this contribution, we demonstrate the successful on–surface metalation of 5,5′–dibromosalophene with Dy under UHV. The morphology and electronic structure of the resulting complexes were investigated using scanning tunneling microscopy and spectroscopy (STM/STS). Experimental insights are complemented by DFT calculations, providing a deeper understanding of the adsorption and metalation processes. ◀

[1] H. Shen, et al., Opt. Mater. 135 (2023) 113219.

[2] T. Yang, et al., Nano Res. 16 (2023) 13457.

[3] L. Wang, et al., CrystEngComm 24 (2022) 1907.