

# Oxidation of an organic adlayer - a bird's eye

## view

*Thomas. Waldmann<sup>1</sup>, Daniela Künze<sup>2</sup>, Harry E. Hoster<sup>1\*</sup>, Axel Groß<sup>2</sup>,*

*R. Jürgen Behm<sup>1</sup>*

<sup>1</sup> Institute of Surface Chemistry and Catalysis, Ulm University, D-89069 Ulm, Germany

Fax: +49 (0)731/50-25452, juergen.behm@uni-ulm.de

<sup>2</sup> Institute of Theoretical Chemistry, Ulm University, D-89069 Ulm, Germany

Fax: +49 (0)731/50-22819, axel.gross@uni-ulm.de

The reaction of O<sub>2</sub> with an adlayer of the oligopyridine 2-phenyl-4,6-bis(6-(pyridine-2-yl)-4-(pyridine-4-yl)pyridine-2-yl)pyrimidine (2,4'-BTP), adsorbed on the (111) surfaces of silver and gold and on HOPG, was investigated by fast scanning tunneling microscopy (video STM) and density functional theory (DFT) calculations. Video STM is used to follow the temporal development of this reaction with an ultra-high sensitivity, reaching down to the single adsorbate level; statistical evaluation of the experimental data provides further information on properties as the resulting structure, the oxygen sticking coefficient / reaction rate and the maximum fraction of reacted molecules, chiral ordering and the enantiomeric excess. DFT calculations resolve the nature of the stable reaction product and, in combination with the experimental data, the reaction pathway; information on the origin of preferential oxidation of one specific N atom in the admolecules is derived from Monte Carlo simulations. The relevance of these findings for reactions involving organic monolayers is discussed.

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<sup>§</sup> present address: TUM CREATE Centre for Electromobility, 62 Nanyang Drive, Singapore