CO oxidation catalysis at multiple length scales

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Curriculum vitae

Willem George Onderwaater was born on September 28, 1984 in Guildford in the UK. He got his highschool degree from the Gymnasium Haganum in The Hague in 2002, and went to Leiden to study physics. After obtaining his Bachelor's degree he continued with a Master's track in experimental physics. He arrived in the surface science group of Prof. Dr. J. W. M. Frenken to work in the field of heterogeneous catalysis and instrumental development. His first Master's thesis concerned the central components of the ReactorAFM, which he worked on under the supervision of Dr. M. E. Cañas Ventura. For his second Master's thesis he moved to Grenoble to work at the European Synchrotron Radiation Facility (ESRF) with Dr. R. van Rijn and Dr. R. Felici on shape changes of Pd nanoparticles during the CO oxidation reaction. In 2011 he received his Master's degree from Leiden University.

Under the supervision of Prof. Dr. J. W. M. Frenken and Dr. R. Felici he continued at Leiden University and the ESRF to pursue a PhD project, which is described in this thesis. He used a wide variety of experimental techniques to investigate the complex behaviour of the model CO oxidation reaction.

List of publications

G. J. Magis, M. J. den Hollander, W. G. Onderwaater, J. D. Olsen, C. N. Hunter, T. J. Aartsma, R. N. Frese, "Light harvesting, energy transfer and electron cycling of a native photosynthetic membrane adsorbed onto a gold surface", *Biochimica et Biophysica Acta* **1798**, 637-645 (2010), DOI: 10.1016/j.bbamem.2009.12.018.

J. Drnec, T. Zhou, S. Pintea, W. G. Onderwaater, E. Vlieg, G. Renaud and R. Felici, "Integration techniques for surface X-ray diffraction data obtained with a two-dimensional detector", *Journal of Applied Crystallography* **47**, 365-377 (2014), DOI: 10.1107/S1600576713032342.

S. B. Roobol, M. E. Cañas-Ventura, M. Bergman, M. A. van Spronsen, W. G. Onderwaater, P. C. van der Tuijn, R. Koehler, A. Ofitserov, G. J. C. van Baarle and J. W. M. Frenken, "The *ReactorAFM*: Non-Contact Atomic Force Microscope operating under high-pressure and high-temperature catalytic conditions", *Review of Scientific Instruments* **86**, 033706 (2015), DOI: 10.1063/1.4916194.

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W. G. Onderwaater, S. B. Roobol, R. van Rijn, O. Balmes, M.E. Cañas Ventura, M. E. Messing, A. Resta, D. Wermeille, R. Westerström, K. Deppert, E. Lundgren, S. Vendelbo, P. J. Kooyman, C. F. Elkjær, S. Helveg, R. Felici and J. W. M. Frenken, "Oxide shell formation during spontaneous oscillations in the catalytic oxidation of CO on palladium nanoparticles", in preparation (chapter 6).

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