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Heterogenized molecular (pre)catalysts for water oxidation and oxygen reduction

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List of Publications

This thesis

Chapter 2

Relevance of Chemical vs. Electrochemical Oxidation of Tunable Carbene Iridium Complexes for Catalytic Water Oxidation

Marta Olivares, *Cornelis J.M. van der Ham*, Mo Li, Markus Schmidtendorf, Helge Müller-Bunz, M.G.W.M. (Tiny) Verhoeven, J.W. (Hans) Niemantsverdriet, Dennis G.H. Hetterscheid, Stefan Bernhard & Martin Albrecht

Submitted

Chapter 3

Activation pathways taking place at molecular copper precatalysts for the oxygen evolution reaction

Cornelis J.M. van der Ham, Furkan Işık, M.G.W.M. (Tiny), J.W. (Hans) Niemantsverdriet & Dennis G.H. Hetterscheid

Catal. Today **2017**, 290, 33–38

Chapter 4

In situ generated copper-phenanthroline complexes as catalysts for the oxygen reduction reaction

Cornelis J.M. van der Ham, Jan P. Hofmann & Dennis G.H. Hetterscheid

In preparation for publication

Chapter 5

Phenanthroline immobilized on Au electrodes as ligand in copper-mediated oxygen re-

duction

Cornelis J.M. van der Ham, Damy Zwagerman, Jan P. Hofmann & Dennis G.H. Hetterscheid

In preparation for publication

Other publications

A new mechanism for the selectivity to C1 and C2 species in the electrochemical reduction of carbon dioxide on copper electrodes

Klaas J. P. Schouten, Youngkook Kwon, *Cornelis J. M. van der Ham*, Zhisheng Qin & Marc T. M. Koper

Chem. Sci. **2011**, 2, 1902–1909

Challenges in Reduction of Dinitrogen by Proton and Electron Transfer

Cornelis J.M. van der Ham, Marc T.M. Koper, & Dennis G.H. Hetterscheid

Chem. Soc. Rev. **2014**, 43, 5183–5191

Early stages of catalyst aging in the iridium mediated water oxidation reaction

Dennis G.H. Hetterscheid *Cornelis J.M. van der Ham*, Oscar Diaz-Morales, M.G.W.M. (Tiny) Verhoeven, Allesandro Longo, Dipanjan Banerjee, J.W. (Hans) Niemantsverdriet, Joost N.H. Reek & Martin C. Feiters

Phys. Chem. Chem. Phys. **2016**, 18, 10931–10940

Validation of EXAFS Analysis of Iridium Compounds

Martin C. Feiters, Allesandro Longo, Dipanjan Banerjee, *Cornelis J.M. van der Ham* & Dennis G.H. Hetterscheid

J. Phys. Conf. Ser. **2016**, 712, 012059

Electrochemical and Spectroscopic Study of Mononuclear Ruthenium Water Oxidation Catalysts: A Combined Experimental and Theoretical Investigation

Jessica M. de Ruiter, Robin L. Purchase, Adriano Monti, *Cornelis J.M. van der Ham*, Maria P. Gullo, Khurram S. Joya, Mila D'Angelantonio, Andrea Barbieri, Dennis G.H. Hetterscheld, Huub J.M. de Groot & Fransesco Buda

ACS Catal. **2016**, 6, 7340–7349 (2016)

Detangling Catalyst Modification Reactions from the Oxygen Evolution Reaction by Online Mass Spectrometry

Paula Abril, M. Pilar del Río, Cristina Tejel, M.G.W.M. (Tiny) Verhoeven, J.W. (Hans) Niemantsverdriet, *Cornelis J.M. van der Ham*, Konstantin G. Kottrup & Dennis G.H. Hetterscheld

ACS Catal. **2016**, 6, 7872–7875

Influence of muzzle instability on bullet deflection, after perforating laminated particle boards

Wim Kerkhof, Ivo Alberink, *Cornelis J.M. van der Ham* & Erwin J.A.T. Mattijssen

Accepted in *J. Forensic Sci.*

doi: 10.1111/1556-4029.14171

Curriculum Vitae

Cornelis Jozef Maria van der Ham was born on September 14th, 1989 in Gouda, the Netherlands. He obtained his high school diploma from the Coenecoop College in Waddinxveen in 2008. He started the joint BSc program *Molecular Science and Technology* at the Leiden and Delft universities, which he in the group of prof. dr. M.T.M. Koper under the supervision of dr. K.J.P. Schouten with a thesis titled *Electro reduction of CO₂ on copper electrodes: investigating a recently suggested mechanism.* in 2011. Subsequently he started his MSc in Chemistry at Leiden University, where he specialized in physical chemistry.

He did an internship at Shell Technology Center Amsterdam under the supervision of dr. A. van Bavel and H. Oosterbeek entitled *A surface science study on model catalysts on the mechanism of the Fischer Tropsch reaction.* He obtained his MSc degree in 2013 on a thesis entitled *Working towards ethanol dissociation on Pt(533)* supervised by dr. L.B.F. Juurlink and dr. A. den Dunnen.

In 2013 he started his PhD at Leiden University in the Catalysis and Surface Chemistry group under the supervision of prof. dr. M.T.M. Koper and dr. D.G.H. Hetterscheid, the results of which are published in this thesis. The results are presented in oral presentations at the COST action CARISMA meeting in Tarragona, Spain in 2015 and at the NWO CHAINS conference in Velthoven, the Netherlands in 2016. Poster presentations were given at the Netherlands' Chemistry and Catalysis Conference (NCCC) in Noordwijkerhout in 2014, at NWO CHAINS in 2015 in Velthoven, at the meeting of the International Society of Electrochemistry in The Hague in 2016 and at the COST action CARISMA meeting in Lisbon in 2017. As part of the PhD program he attended the NIOK course *Catalysis an Integrated Approach* and the HRSMC course *Physical Methods in Inorganic Chemistry*,

He is currently working in the gunshot residues group at the Netherlands Forensic Institute.

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