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Platinum electrochemistry through a magnifying glass

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List of publications

Chapter 2

Correlation of surface site formation to nanoisland growth in the electrochemical roughening of Pt(111)

Jacobse, L., Huang, Y.-E., Koper, M.T.M. & Rost, M.J. *Nat. Mater.* **17**, 277–282 (2018)

- Duurzame elektrodes voor waterstofeconomie
Jacobse, L., Rost, M.J. & Koper, M.T.M. *Nederlands Tijdschrift voor Natuurkunde* **84**(9) (2018)
- Eilandjes van platina
Dijkgraaf, A. *C2W* **114**(3) 15 (2018)
- Observing a changing platinum electrode
te Roller, E., Leiden University Newsletter 2 (2018)

Chapter 3

Atomic-scale identification of the electrochemical roughening of platinum

Jacobse, L., Rost, M.J. & Koper, M.T.M. submitted

Chapter 4

Voltammetric scanning electrochemical cell microscopy: dynamic imaging of hydrazine electro-oxidation on platinum electrodes

Chen, C.H., Jacobse, L., McKelvey, K., Lai, S.C.S., Koper, M.T.M., & Unwin, P.R. *Anal. Chem.* **87**, 5782–5789 (2015)

Chapter 5

The reactivity of platinum microelectrodes

Jacobse, L., Raaijman, S.J. & Koper, M.T.M. *Phys. Chem. Chem. Phys.* **18**, 28451–28457 (2016)

Other publications

LEED analysis of a nickel cylindrical single crystal

Mom R.V., Hahn C., Jacobse L. & Juurlink L.B.F. *Surf. Sci.* **613**, 15–20 (2013)

Reaction dynamics of initial O₂ sticking on Pd(100)

den Dunnen A., Wiegman S., Jacobse L. & Juurlink L.B.F. *J. Chem. Phys.* **142**(21), (2015)

The molecular dynamics of adsorption and dissociation of O₂ on Pt(553)
Jacobse L., den Dunnen A. & Juurlink L.B.F. *J. Chem. Phys.* **143**(1), (2015)

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den Dunnen A., Jacobse L., Wiegman S., Berg O.T. & Juurlink L.B.F. *J. Chem. Phys.*
144(24), 244706 (2016)

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UK, August–September 2016
Actis, P., Bentley, C. L., Edwards, M. A., & Jacobse, L. *Chem. Commun.* **52**,
13934–13940 (2016)

Simultaneous scanning tunneling microscopy and synchrotron X-ray measure-
ments in a gas environment
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Alkemade P.F.A., Vandalon V., van Spronsen M.A., van Weeren M., Crama L., van
der Tuijn P.C., Felici R., Kessels W.M.M., Carla F., Frenken J.W.M. & Groot I.M.N.
Ultramicroscopy **182**, 233–242 (2017)

Heterogeneous catalytic oxidation of simple alcohols by transition metals
Jacobse, L., Vink, S.O., Wijngaarden S & Juurlink, L.B.F. *J. Chem. Ed.* **94**(9) 1285–1287
(2017)

Misconceptions in the exploding flask demonstration resolved through students'
critical thinking
Spierenburg, R., Jacobse, L., de Bruin, I., van den Bos, D.J., Vis, D.M. & Juurlink,
L.B.F. *J. Chem. Ed.* **94**(9) 1209–1216 (2017)

- Studenten ontrafelen werking klassiek experiment
Moezelaar, R. *Nemo Kennislink* (2017)
- De Platina Katalysator
Science 071, *Sleutelstad FM* (2017)
- Tweedejaars halen wetenschappelijk tijdschrift met scheikundeproef
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The dualism between adatom- and vacancy-based single crystal growth models
Rost, M.J., Jacobse, L. & Koper, M.T.M. to be submitted

Curriculum vitae

Leon Jacobse was born on June 3rd 1990 in Rotterdam and raised in the lowest point of The Netherlands: Nieuwerkerk a/d IJssel. From 2002-2008 he performed his high school studies at the Coornhert Gymnasium in Gouda. Beyond several in-house extracurricular projects, he also participated in two projects organized by Leiden University: in 2006 he joined the Leiden Advanced Pre-university Program for TOP students (LAPP-TOP) on Astronomy; and in 2007-2008 he joined the prestigious Pre-University College, studying topics varying from philosophy to history of medicine.

It was Pre-University College that introduced Leon to the research at the Leiden Institute of Chemistry via a three-week internship in organic synthesis. This project played a significant role in his decision to start the BSc program Molecular Science & Technology in 2008. His thesis research was performed with Dr. Ludo Juurlink in the Catalysis and Surface Chemistry (CASC) group and eventually contributed to his first scientific publication.

After graduating in 2011, Leon spend a year in the board of the study association for chemistry: Chemisch Dispuut Leiden. Apart from many general activities, he was mainly involved in educational affairs. These tasks connected really well to his minor studies: Education in Chemistry, for which he spent half a year teaching chemistry at the Wolfert van Borselen high-school in Rotterdam.

For his MSc studies, Leon returned to the CASC group, collaborating with Dr. Ludo Juurlink and Angela den Dunnen. In 2013, he graduated cum laude on his research regarding the interaction between gas-phase oxygen and well-defined platinum and palladium surfaces.

Although Leon stayed within the same research group for his PhD, the type of research changed drastically from surface science to electrochemistry. Under the guidance of Prof. dr. Marc Koper he started studying the relationship between local reactivity and surface structure of platinum surfaces under electrochemical conditions. In an exchange project with the group of Prof. dr. Patrick Unwin at the University of Warwick, he contributed to the development of a new mode for imaging local electrochemical reactivity (voltammetric scanning electrochemical cell microscopy). Back in Leiden his research focused on the atomic scale surface dynamics of Pt(111) using electrochemical scanning tunneling microscopy together with Dr. Marcel Rost and Dr. Yi-Fan Huang.

During his PhD, Leon supervised several students in their research projects and contributed intensively to the 'General and Inorganic Chemistry' freshman's course. His affinity with teaching also showed within the CASC group, where he was involved in courses on the use of IGOR and LaTeX software. Finally, he gave oral presentations on his scientific results at various (inter)national conferences, among which; the annual Dutch chemistry and electrochemistry symposia (2015 and 2016, respectively); the annual meetings of the International Society of Electrochemistry in 2017 and 2018; and the spring meetings of the Deutsche Physikalische Gesellschaft in 2017 and 2018.

Starting from December 2018, Leon will continue this scientific career as a postdoctoral fellow at the DESY (Deutsches Elektronen-Synchrotron) NanoLab in Hamburg with Prof. dr. Andreas Stierle, studying model electrocatalysts under *operando* conditions.