Universiteit Leiden
The Netherlands

Biomass Electrochemistry : from cellulose to sorbitol

Kwon, Y.

Citation
Kwon, Y. (2013, September 5). *Biomass Electrochemistry : from cellulose to sorbitol*. Retrieved from https://hdl.handle.net/1887/21649

Version:	Not Applicable (or Unknown)
License:	Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden
Downloaded from:	https://hdl.handle.net/1887/21649

Note: To cite this publication please use the final published version (if applicable).

Cover Page

Universiteit Leiden

Leiden University Repository

The handle http://hdl.handle.net/1887/21649 holds various files of this Leiden University dissertation.

Author: Kwon, Youngkook
Title: Biomass electrochemistry : from cellulose to sorbitol
Issue Date: 2013-09-05

List of Publications

This thesis is based on the following publications:

Chapter 2

Y. Kwon and M. T. M. Koper, Combining Voltammetry with HPLC: Application to Electro-Oxidation of Glycerol, *Anal. Chem.* **82** (2010) 5420-5424.

Chapter 3

Y. Kwon, K.-J. P. Schouten, and M. T. M. Koper, Mechanism of the catalytic oxidation of glycerol on polycrystalline platinum and gold electrodes, *ChemCatChem*, **3** (2011) 1176-1185.

Chapter 4

Y. Kwon, Y. Birdja, I. Spanos, P. Rodriguez, and M. T. M. Koper, Highly selective electro-oxidation of glycerol to dihydroxyacetone on platinum in the presence of bismuth, *ACS Catal.*, **2** (2012) 759–764.

Chapter 5

Y. Kwon, S. C. S. Lai, P. Rodriguez, and M. T. M. Koper, Electrocatalytic oxidation of alcohols on gold in alkaline media: base or gold catalysis?, *J. Am. Chem. Soc.*, **133** (2011) 6914–6917.

Chapter 6

Y. Kwon, S. E. F. Kleijn, K. J. P. Schouten, and M. T. M. Koper, Cellobiose Hydrolysis and Decomposition by Electrochemical Generation of Acid and Hydroxyl Radicals, *ChemSusChem*, **5** (2012) 1935-1943.

Chapter 7

Y. Kwon and M. T. M. Koper, Electrocatalytic hydrogenation and deoxygenation of glucose on solid metal electrodes, *ChemSusChem*, **6** (2013) 455-462.

Chapter 8

Y. Kwon, E. de Jong, S. Raoufmoghaddam, and M. T. M. Koper, Electrocatalytic hydrogenation of 5-hydroxymethylfurfural in the absence and presence of glucose, *ChemSusChem*, 2013, DOI: 10.1002/cssc.201300443.

In addition, the author has contributed to the following articles:

- Y. Kwon, S. J. Raaijman, and M. T. M. Koper, Role of peroxide in the catalytic activity of gold for oxidation reactions in aqueous media: an electrochemical study, 2013, submitted.

- H. Li, F. Calle-Vallejo, M. J. Kolb, Y. Kwon, Y. Li, and M. T. M. Koper, Why the (100) terrace breaks and makes bonds: oxidation of dimethylether on platinum single-crystal electrodes, 2013, submitted.

- J. Yang, Y. Kwon, M. Duca, and M. T.M. Koper, Combining voltammetry and ion chromatography: application to the selective reduction of nitrate on Pt and PtSn electrodes, 2013, submitted.

- R. Kortlever, K. H. Tan, Y. Kwon, and M. T. M. Koper, Electrochemical CO_2 reduction on copper in weakly alkaline media, *J. Solid State Electrochem.*, **7** (2013) 1843-1849.

- P. Rodriguez, Y. Kwon, and M. T. M. Koper, The promoting effect of adsorbed carbon monoxide on the oxidation of alcohols on a gold catalyst, *Nature Chem.*, **4** (2012) 177-182. (**Front Cover of Issue**)

- K. J. P. Schouten, Y. Kwon, C. J. M. van der Ham, Z. Qin, and M. T. M. Koper, A new mechanism for the selectivity to C_1 and C_2 species in the electrochemical reduction of carbon dioxide on copper electrodes, *Chem. Sci.*, **2** (2011) 1902-1909. (**Inside Cover of Issue**)

- A. Santasalo-Aarnio, Y. Kwon, E. Ahlberg, K. Kontturi, T. Kallio, and M. T. M. Koper, Comparison of methanol, ethanol and iso-propanol oxidation on Pt and Pd electrodes in alkaline media studied by HPLC, *Electrochem. Commun.* **13** (2011) 466-469.

In magazine

- Y. Kwon and M. T. M. Koper, Product detection in electrochemical cells: combining cyclic voltammetry and HPLC by employing fraction collection, *Shimadzu News* **3** (2010) 20-21.

Other publications

- Y. Kwon, H. J. Lee, and J. Lee, Autonomous interfacial creation of nanostructured lead oxide, *Nanoscale*, **3** (2011) 4984-4988. (**Front Cover of Issue**)

- Y. Kwon and J. Lee, Formic Acid from Carbon Dioxide on Nanolayered Electrocatalyst, *Electrocatal.* **1** (2010) 108-115.

- H. Jeon, J. Joo, Y. Kwon, S. Uhm, and J. Lee, Morphological features of electrodeposited Pt nanoparticles and its application as anode catalysts in polymer electrolyte formic acid fuel cells, *J. Power Sources* **195** (2010) 5929-5923.

- J. Y. Joo, J. K. Lee, Y. Kwon, C. R. Jung, E. S. Lee, J. H. Jang, H. J. Lee, S. Uhm, and J. Lee, Enhancement of CO Tolerance on Electrodeposited Pt Anode for Micro-PEM Fuel Cells, *Fuel Cells* **10**(6) (2010) 926-931.

- J. Lee, Y. Kwon, R. L. Machunda, and H. J. Lee, Electrocatalytic Recycling of CO_2 and Small Organic Molecules, *Chem. Asian J.* **4** (2009) 1516-1523.

- Y. Kwon, J. K. Lee, D. Ji, and J. Lee, Electrochemical characteristics of home-made bipolar plate and its relationship with fuel cell performance, *J. Korean Electrochem. Soc.* **12**(1) (2009) 68-74. (Korean)

- S. Uhm, H. J. Lee, Y. Kwon, and J. Lee, A Stable and Cost-Effective Anode Catalyst Structure for Formic Acid Fuel Cells, *Angew. Chem. Int. Ed.* **47** (2008) 10163-10166.

- Y. Kwon, S. Uhm, and J. Lee, Development of a Direct Formic Acid Fuel Cell Anode by Multi-Layered Bismuth Modification, *Korean Chem. Eng. Res.* **46** (2008) 697-700. (Korean)

- S. Uhm, Y. Kwon, S. T. Chung, and J. Lee, Highly effective anode structure in a direct formic acid fuel cell, *Electrochim. Acta* **53** (2008) 5162-5168.

Curriculum Vitae

Youngkook was born in Gimcheon, a city in North Gyeongsang Province in South Korea in 1979. After high school, he moved to Seoul to study Environmental Engineering at Kwangwoon University (1998-2005, including military service for 26 months) and finished his bachelor study with the research topic of "*Arsenic Removal from Mine Tailings*". Before starting master course, he worked in companies to learn business and economics especially in sales and accounting departments until 2007. For his master's degree, he studied electrochemistry in the department of environmental science and engineering at GIST (Gwangju Institute of Science and Technology) under the supervision of Prof. Dr. Jaeyoung Lee with the research topic of "*Electrocatalytic Recycling of CO_2 and Small Organic Molecules*" 1) developing a stable and cost-effective anode catalyst for formic acid fuel cells, and 2) CO_2 reduction to formic acid on Pb electrode.

In September 2009, Youngkook started his PhD work in Leiden University (the Netherlands) under the supervision of Prof. Dr. Marc T. M. Koper with the project title of "*Biomass Electrochemistry: from cellulose to sorbitol*" sponsored by the CatchBio Smart Mix Program, to find out new electrochemistry-based routes of catalysis for sustainable chemicals from biomass. The results of this work are presented in this thesis. Parts of his work have been presented at several international conferences.