



Universiteit
Leiden
The Netherlands

Fundamental research on the voltammetry of polycrystalline gold

Yang, S.

Citation

Yang, S. (2024, April 9). *Fundamental research on the voltammetry of polycrystalline gold*. Retrieved from <https://hdl.handle.net/1887/3731809>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3731809>

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

CURRICULUM VITAE

Shengxiang Yang was born in Yunnan, China in July 1990. He earned his bachelor's degree in Environmental Engineering from Lanzhou University in 2013. His research focused on "The Influence of Sewage Irrigation on Maize Plants". During his undergraduate studies, he received the "Innovative Style Scholarship" (Reward for Outstanding Performance in the Art, Sport or Research) and the "Second-class Scholarship" from Lanzhou University.

In 2014, he relocated to Xuzhou, where he commenced his research on "Effective Nitrate-Ammonia Simultaneous Electroreduction into Nitrogen in Different Electrode Reactor Configurations" as a master's student in Environmental Engineering at China University of Mining and Technology, under the supervision of Prof. Lizhang Wang. Throughout his master's studies, he was honored with the "First-class Scholarship" from 2014 to 2016. Additionally, he received the "Master of innovation scholarship" (Reward for Outstanding Researcher) and the "National Scholarship" (Top 2%) at 2016.

In September 2017, he embarked on his doctoral journey as a PhD candidate in the research group of Dr. Dennis Hetterscheid. During his PhD, he conducted research in the labs of the Metals in Catalysis, Biomimetics & Inorganic Materials (MCBIM) and the Catalysis and Surface Chemistry (CASC) research groups. The results of the studies, included in this thesis, were presented as oral presentations at the 2020 Netherlands Catalysis and Chemistry Conference (NCCC) and the 2023 Kroese-Duijsters Symposium. Furthermore, he participated in or presented some of his research work as posters at the NCCC (2019, 2021), the Chemistry as Innovative Science (CHAINS, online) conference (2020), the Reedijk Symposium (2018, 2019, 2020, 2023) and the Holland Research School of Molecular Chemistry (HRSMC) Symposium (2017, 2018, 2019).

During his PhD, he attended various schools and courses, including "Catalysis: An Integrated Approach" organized by the Netherlands Institute for Catalysis Research, HRSMC courses such as "Physical Methods in Inorganic Chemistry", "High Impact Writing", as well as "the Scientific Conduct" course provided by the Graduate School of Leiden University. He also participated in the summer school course "Electrochemical Approaches to Chemical Synthesis"

organized by the International Center for Advanced Studies of Energy Conversion and the graduate school course “Effective Communication and Scientific Conduct” organized by Leiden University. Additionally, during his PhD, he supervised a BSc student (Baño Gómez Javier).

Published:

1. **Yang, S.**; Hetterscheid, D. G. H., Redefinition of the active species and the mechanism of the oxygen evolution reaction on gold oxide. *ACS Catal.* **2020**, *10*, 12582-12589.
2. **Yang, S.**; Wang, L.; Jiao, X.; Li, P., Electrochemical Reduction of Nitrate on Different Cu-Zn Oxide Composite Cathodes. *Int. J. Electrochem. Sci.* **2017**, *12*, 4370-4383.
3. **Yang, S.**, Wang, L., Wu, B., Zhang, B., Li, Z. Electrochemical oxidation of phenol on AC/SnO₂-Sb particle electrodes. *Chem. Industry Eng. Prog.*, **2016**, *35* (4): 1230-1236.
4. Wang, L.; **Yang, S.**; Wu, B.; Li, P.; Li, Z.; Zhao, Y., The influence of anode materials on the kinetics toward electrochemical oxidation of phenol. *Electrochim. Acta* **2016**, *206*, 270-277.
5. Wang, L.; **Yang, S.**; Wu, B.; Li, Z.; Li, P.; Zhao, Y., A comparative study for electrochemical oxidation of aromatic compounds in the absence and in the presence of granular activated carbon (GAC). *Int. J. Electrochem. Sci.* **2016**, *11*, 2284-2296.
6. Kong, Y.; Wang, L. Z.; **Yang, S.**; Zhao, P., Preparation and Electro-catalytic Mechanisms for Nitrate Ion Reduction of Ti_(100-δ)Cu_δ(δ=0.02, 0.09, 0.28, 1.39, 5.65) Cathodes. *Chemical Journal of Chinese Universities-Chinese* **2018**, *39*, 132-140.
7. Wang, L.; Zhao, Y.; **Yang, S.**; Wu, B.; Li, P.; Zhao, Y., Employment of TiO₂/AC as particulate electrode for efficient phenol oxidation. *Int. J. Electrochem. Sci.* **2016**, *11*, 2401-2407.
8. Wang, L.; Kong, Y.; Wei, D.; **Yang, S.**; Chen, Q.; Kong, Y.; Li, P.; Ting, Y. ; Ong, C. N., Toward the quantitative evaluation of an activated carbon particle electrode performance in a packed-bed system. *Chemelectrochem* **2017**, *4*, 2464-2468.
9. Wang, L.; Kong, Y.; Jiang, J.; Wei, D.; Li, P.; **Yang, S.**; Ting, Y., Optimal wastewater treatment using a packed-bed electrode reactor (PBER): From laboratory experiments to industrial-scale approaches. *Chemical Engineering Journal* **2018**, *334*, 707-713.
10. Li, Z. N.; Wang, L. Z.; Zhao, Y.; Li, P.; **Yang, S.**, Effect of Sodium Dodecyl Sulfate (SDS) on Electro-Catalytic Performances of IrO₂-Ta₂O₅/SnO₂-Sb-MnO₂/Ti Electrode. *Rare Metal Materials and Engineering* **2017**, *46*, 2963-2968.

Under review:

1. **Yang, S.;** Hetterscheid, D. G. H., Tracing the dynamic structural changes occurring in amorphous metal oxides during catalysis through mapping of non-Nernstian behavior.

Manuscript in preparation:

1. **Yang, S.;** Hetterscheid, D. G. H., Exploring the excess free charge distribution under catalytic conditions using a quartz crystal microbalance methodology.

2. **Yang, S.;** Peng L.; Hetterscheid, D. G. H., Electrochemical quartz crystal microbalance (EQCM) study recognize non-Faradaic from Faradaic behavior in the electrode-driven electrochemical process.

ACKNOWLEDGMENT

First, I want to express my gratitude to the China Scholarship Council (CSC) for their financial support through grant number 201706420073. This support has been instrumental in my academic journey.

I extend my heartfelt thanks to Dr. Dennis Hetterscheid for offering me a PhD position in his group and for his guidance over the past years. Dennis, thank you for allowing me the freedom to explore electrochemistry and for instilling in me to a scientific mindset in every discussion. I will miss our brainstorming sessions, and your insightful questions have helped me grow.

I also wish to thank Prof. Dr. M.T.M. Koper for his invaluable discussions and feedback on my thesis chapters, which have significantly enhanced its quality. Additionally, I am grateful for the feedback from group members and the enjoyable outing organized by the Metals in Catalysis, Biomimetics & Inorganic Materials (MCBIM) and the Catalysis and Surface Chemistry (CASC) research groups.

A special thanks goes to my fellow "Minions" for their support and enjoyable company. Konstantin, Koen, Martijn, Silvia, Nicole, Michiel, Bas, Daan, Andrey, Kyra, Dana, Ross, Jan, Phebe, Sjoerd, Marleen, Yidan, and Charlotte, your contributions to our scientific discussions and the relaxed working environment you all fostered are truly appreciated.

I am thankful to my friends in Leiden—Chengyu, Weizhe, Xuequan, Mengjie, Mingchuan, Diyu, Chunmiao, Ye, Yurong, Chen, Yi, Chenguang, Deyi, Xiaoting, Zhiqin, Linfan, Jinwen, Wanbin, Fen, Lin, Liyan, Juan, and Furong—for the wonderful moments we shared. Meeting my promoters, colleagues, and friends in the Netherlands has been a joy, and I am sure my time here will be among my most cherished memories.

Finally, I wish to extend my heartfelt appreciation to my family for their steadfast support. Despite they may not fully understand my work, their belief in and support for me have been unwavering.

Shengxiang

In Leiden, April, 2024