

Defect chemistry of Ceria investigated with microwaves Carsten Steiner defended his doctoral thesis

Congratulations!

Carsten Steiner defended his doctoral thesis about “Microwave-based analysis of the defect chemistry of cerium-zirconium mixed oxides” (German original title: “*Mikrowellengestützte Analyse der Defektchemie von Cer-Zirkonium-Mischoxiden*”) on Monday, July 1st, 2024.

Dr. Steiner's work bases on a close collaboration with the chair of Prof. Dr.-Ing. Holger Fritze (TU Clausthal). Special thanks to him for his support as the second examiner!

Dr. Steiner already published several parts of his thesis in peer-reviewed journals (examples):

C. Steiner, V. Malashchuk, D. Kubinski, G. Hagen, R. Moos, Microwave-Based State Diagnosis of Three-Way Catalysts: Impact Factors and Application Recommendations, *Sensors*, **24**, 4091 (2024), doi: [10.3390/s24134091](https://doi.org/10.3390/s24134091)

C. Steiner, G. Hagen, I. Kogut, H. Fritze, R. Moos, Analysis of defect mechanisms in nonstoichiometric ceria-zirconia by the microwave cavity perturbation method, *Journal of the American Ceramic Society*, **106**, 2875-2892 (2023), doi: [10.1111/jace.18938](https://doi.org/10.1111/jace.18938)

C. Steiner, G. Hagen, I. Kogut, H. Fritze, R. Moos, Analysis of defect chemistry and microstructural effects of non-stoichiometric ceria by the high-temperature microwave cavity perturbation method, *Journal of the European Ceramic Society*, **42**, 499-511 (2022), doi: [10.1016/j.jeurceramsoc.2021.08.053](https://doi.org/10.1016/j.jeurceramsoc.2021.08.053)

C. Steiner, S. Walter, V. Malashchuk, G. Hagen, I. Kogut, H. Fritze, R. Moos, Determination of the Dielectric Properties of Storage Materials for Exhaust Gas Aftertreatment Using the Microwave Cavity Perturbation Method, *Sensors*, **20**, 6024 (2020), doi: [10.3390/s20216024](https://doi.org/10.3390/s20216024)

C. Steiner, V. Malashchuk, D. Kubinski, G. Hagen, R. Moos, Catalyst State Diagnosis of Three-Way Catalytic Converters Using Different Resonance Parameters—A Microwave Cavity Perturbation Study, *Sensors*, **19**, 3559 (2019), doi: [10.3390/s19163559](https://doi.org/10.3390/s19163559)

C. Steiner, A. Gänzler, M. Zehentbauer, G. Hagen, M. Casapu, S. Müller, J.-D. Grunwaldt, R. Moos, Oxidation State and Dielectric Properties of Ceria-Based Catalysts by Complementary Microwave Cavity Perturbation and X-Ray Absorption Spectroscopy Measurements, *Topics in Catalysis*, **62**, 227-236 (2019), doi: [10.1007/s11244-018-1110-3](https://doi.org/10.1007/s11244-018-1110-3)



The evaluation board and the candidate.

From left to right: Prof. Moos, Prof. Jess, Dr. Steiner, Prof. Fritze, and Prof. Döpper