

Selection of papers in the field of chemical sensors (mainly selected peer reviewed articles and book contributions)

T. Wöhrl, M. König, R. Moos, G. Hagen:

Monitoring of Ammonia in Biomass Combustion Flue Gas Using a Zeolite-Based Capacitive Sensor

open access - free *Sensors*, **25**, 5519 (2025), doi: [10.3390/s25175519](https://doi.org/10.3390/s25175519)

T. Wöhrl, R. Moos, G. Hagen:

Analyzing the cross-sensitivities of a zeolite-based ammonia sensor for SCR systems for application in the flue gas of biogenic waste combustion

open access - free *Sensors and Actuators B: Chemical*, **436**, 137727 (2025), doi: [10.1016/j.snb.2025.137727](https://doi.org/10.1016/j.snb.2025.137727)

C. Steiner, G. Hagen, R. Moos:

Sulfur poisoning of powder aerosol deposited films of $\text{BaFe}_{0.74}\text{Al}_{0.01}\text{Ta}_{0.25}\text{O}_{3-\delta}$: A material for resistive temperature independent oxygen sensors

open access - free *Sensors and Actuators B: Chemical*, **425**, 136984 (2025), doi: [10.1016/j.snb.2024.136984](https://doi.org/10.1016/j.snb.2024.136984)

T. Thathsara, C.J. Harrison, D. Schönauer-Kamin, U. Mansfeld, R. Moos, F.M. Malherbe, R.K. Hocking, M. Shafiei:

Pd Nanoparticles Decorated Hollow TiO_2 Nanospheres for Highly Sensitive and Selective UV-Assisted Hydrogen Gas Sensors

ACS Applied Energy Materials, **7**, 5608-5620 (2024), doi: [10.1021/acsaem.4c01039](https://doi.org/10.1021/acsaem.4c01039)

N. Donker, D. Schönauer-Kamin, R. Moos:

Mixed-Potential Ammonia Sensor Based on a Dense Yttria-Stabilized Zirconia Film Manufactured at Room Temperature by Powder Aerosol Deposition

open access - free *Sensors*, **24**, 811 (2024), doi: [10.3390/s24030811](https://doi.org/10.3390/s24030811)

T. Wöhrl, J. Kita, R. Moos, G. Hagen:

Capacitive, Highly Selective Zeolite-Based Ammonia Sensor for Flue Gas Applications

open access - free *Chemosensors*, **11**, 413 (2023), doi: [10.3390/chemosensors11070413](https://doi.org/10.3390/chemosensors11070413)

T. Wöhrl, J. Herrmann, J. Kita, R. Moos, G. Hagen:

Methods to investigate the temperature distribution of heated ceramic gas sensors for high-temperature applications

open access - free *Journal of Sensors and Sensor Systems*, **12**, 205-214 (2023), doi: [10.5194/jsss-12-205-2023](https://doi.org/10.5194/jsss-12-205-2023)

C. Steiner, T. Wöhrl, M. Steiner, J. Kita, A. Müller, H. Eisazadeh, R. Moos, G. Hagen:

Resistive Multi-Gas Sensor for Simultaneously Measuring the Oxygen Stoichiometry (λ) and the NO_x Concentration in Exhausts: Engine Tests under Dynamic Conditions

open access - free *Sensors*, **23**, 5612 (2023), doi: [10.3390/s23125612](https://doi.org/10.3390/s23125612)

C. Steiner, S. Püls, M. Bektas, A. Müller, G. Hagen, R. Moos:

Resistive, Temperature-Independent Metal Oxide Gas Sensor for Detecting the Oxygen Stoichiometry (Air-Fuel Ratio) of Lean Engine Exhaust Gases

open access - free *Sensors*, **23**, 3914 (2023), doi: [10.3390/s23083914](https://doi.org/10.3390/s23083914)

G. Hagen, J. Herrmann, X. Zhang, H. Kohler, I. Hartmann, R. Moos:

Application of a Robust Thermoelectric Gas Sensor in Firewood Combustion Exhausts

open access - free *Sensors*, **23**, 2930 (2023), doi: [10.3390/s23062930](https://doi.org/10.3390/s23062930)

CO Gas Detection on Pt|YSZ|Pt Solid Electrolyte Sensors by Methods Based on Dynamic Voltage Variations

Journal of The Electrochemical Society, **168**, 117506 (2021), doi: [10.1149/1945-7111/ac2fc5](https://doi.org/10.1149/1945-7111/ac2fc5)

R. Wagner, D. Schönauer-Kamin, W. Bäther, R. Moos:

Concept study with experimental proof for a new type of detector for gas chromatography

Sensors and Actuators B: Chemical, **346**, 130490 (2021), doi: [10.1016/j.snb.2021.130490](https://doi.org/10.1016/j.snb.2021.130490)

A. Ruchets, N. Donker, J. Zosel, D. Schönauer-Kamin, R. Moos, U. Guth, M. Mertig:

CO Gas Detection on Pt|YSZ|Pt Solid Electrolyte Sensors by Methods Based on Dynamic Voltage Variations

Journal of The Electrochemical Society, **168**, 117506 (2021), doi: [10.1149/1945-7111/ac2fc5](https://doi.org/10.1149/1945-7111/ac2fc5)

V. Malashchuk, A. Jess, R. Moos:

Determination of water loading of supported ionic liquids by microwave analysis - A contribution for operando monitoring of gas drying by adsorption

Sensors and Actuators B: Chemical, **335**, 129646 (2021), doi: [10.1016/j.snb.2021.129646](https://doi.org/10.1016/j.snb.2021.129646)

R. Wagner, D. Schönauer-Kamin, R. Moos:

Influence of Humidity and Different Gases on a Resistive Room Temperature NO_2 Gas Dosimeter Based on Al-Doped ZnO for ppb-Concentration Detection

open access - free *Journal of The Electrochemical Society*, **167**, 167516 (2020), doi: [10.1149/1945-7111/abcb65](https://doi.org/10.1149/1945-7111/abcb65)

A. Ruchets, N. Donker, J. Zosel, D. Schönauer-Kamin, R. Moos, U. Guth, M. Mertig:

Cyclic and square-wave voltammetry for selective simultaneous NO and O_2 gas detection by means of solid electrolyte sensors

open access - free *Journal of Sensors and Sensor Systems*, **9**, 355-362 (2020), doi: [10.5194/jsss-9-355-2020](https://doi.org/10.5194/jsss-9-355-2020)

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

open access - free *Sensors*, **20**, 6024 (2020), doi: [10.3390/s20216024](https://doi.org/10.3390/s20216024)

J. Herrmann, G. Hagen, J. Kita, F. Noack, D. Bleicker, R. Moos:

Multi-gas sensor to detect simultaneously nitrogen oxides and oxygen

open access - free *Journal of Sensors and Sensor Systems*, **9**, 327-335 (2020), doi: [10.5194/jsss-9-327-2020](https://doi.org/10.5194/jsss-9-327-2020)

N. Donker, A. Ruchets, D. Schönauer-Kamin, J. Zosel, U. Guth, R. Moos:

Influence of Pt paste and the firing temperature of screen-printed electrodes on the NO detection by pulsed polarization

open access - free *Journal of Sensors and Sensor Systems*, **9**, 293-300 (2020), doi: [10.5194/jsss-9-293-2020](https://doi.org/10.5194/jsss-9-293-2020)

D. Schönauer-Kamin, I. Marr, M. Zehentbauer, C. Zängle, R. Moos:

Characterization of the sensitive material for a resistive NO_x gas dosimeter by DRIFT spectroscopy

Sensors and Actuators B: Chemical, **320**, 128568 (2020), doi: [10.1016/j.snb.2020.128568](https://doi.org/10.1016/j.snb.2020.128568)

S. Walter, P. Schwanzer, G. Hagen, G. Haft, H.-P. Rabl, M. Dietrich, R. Moos:

Modelling the Influence of Different Soot Types on the Radio-Frequency-Based Load Detection of Gasoline Particulate Filters

open access - free *Sensors*, **20**, 2659 (2020), doi: [10.3390/s20092659](https://doi.org/10.3390/s20092659)

R. Wagner, D. Schönauer-Kamin, R. Moos:

Novel Operation Strategy to Obtain a Fast Gas Sensor for Continuous ppb-Level NO₂ Detection at Room Temperature Using ZnO—A Concept Study with Experimental Proof

open access - free *Sensors*, **19**, 4104 (2019), doi: [10.3390/s19194104](https://doi.org/10.3390/s19194104)

T. Ritter, J. Lattus, G. Hagen, R. Moos:

On the influence of the NO_x equilibrium reaction on mixed potential sensor signals: A comparison between FE modelling and experimental data

Sensors and Actuators B: Chemical, **296**, 126627 (2019), doi: [10.1016/j.snb.2019.126627](https://doi.org/10.1016/j.snb.2019.126627)

N. Donker, A. Ruchets, D. Schönauer-Kamin, J. Zosel, U. Guth, R. Moos:

Influence of polarization time and polarization current of Pt|YSZ-based NO sensors utilizing the pulsed polarization when applying constant charge

Sensors and Actuators B: Chemical, **290**, 28-33 (2019), doi: [10.1016/j.snb.2019.03.060](https://doi.org/10.1016/j.snb.2019.03.060)

A. Ruchets, N. Donker, D. Schönauer-Kamin, R. Moos, J. Zosel, U. Guth, M. Mertig:

Selectivity improvement towards hydrogen and oxygen of solid electrolyte sensors by dynamic electrochemical methods

Sensors and Actuators B: Chemical, **290**, 53-58 (2019), doi: [10.1016/j.snb.2019.03.063](https://doi.org/10.1016/j.snb.2019.03.063)

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

open access - free *Sensors*, **19**, 3559 (2019), doi: [10.3390/s19163559](https://doi.org/10.3390/s19163559)

T. Ritter, M. Seibel, F. Hofmann, M. Weibel, R. Moos:

Simulation of a NO_x Sensor for Model-Based Control of Exhaust Aftertreatment Systems

Topics in Catalysis, **62**, 150-156 (2019), doi: [10.1007/s11244-018-1102-3](https://doi.org/10.1007/s11244-018-1102-3)

T. Ritter, J. Lattus, G. Hagen, R. Moos:

A finite element model for mixed potential sensors

Sensors and Actuators B: Chemical, **287**, 476-485 (2019), doi: [10.1016/j.snb.2019.02.052](https://doi.org/10.1016/j.snb.2019.02.052)

P. Chen, V. Rizzotto, A. Khetan, K. Xie, R. Moos, H. Pitsch, D. Ye, U. Simon:

Mechanistic understanding of Cu-CHA catalyst as sensor for direct NH₃-SCR monitoring: the role of Cu mobility

ACS Applied Materials & Interfaces, **11**, 8097-8105 (2019), doi: [10.1021/acsami.8b22104](https://doi.org/10.1021/acsami.8b22104)

M.-L. Anke, M. Hämmerle, R. Moos, A. Jess:

Operando Determination of the Thermal Decomposition of Supported Ionic Liquids by a Radio-Frequency-Based Method

open access - free *ACS Omega*, **4**, 3351-3360 (2019), doi: [10.1021/acsomega.8b02421](https://doi.org/10.1021/acsomega.8b02421)

S. Walter, A. Bogner, G. Hagen, R. Moos:

Novel radio-frequency-based gas sensor with integrated heater

open access - free *Journal of Sensors and Sensor Systems*, **8**, 49-56 (2019), doi: [10.5194/jsss-8-49-2019](https://doi.org/10.5194/jsss-8-49-2019)

T. Ritter, J. Lattus, G. Hagen, R. Moos:

Effect of the Heterogeneous Catalytic Activity of Electrodes for Mixed Potential Sensors

open access - free *Journal of the Electrochemical Society*, **165**, B795-B803 (2018), doi: [10.1149/2.0181816jes](https://doi.org/10.1149/2.0181816jes)

L. Vogel, R. Wagner, R. Moos, D. Schönauer-Kamin:

Investigations on the crystal growth mechanism of one-pot-synthesized Al-doped ZnO and its UV-enhanced room temperature NO₂ gas sensing characteristics

Functional Materials Letters, **11**, 1850087 (2018), doi: [10.1142/S179360471850087X](https://doi.org/10.1142/S179360471850087X)

M.-L. Anke, M. Hämmerle, A. Jess, R. Moos:

Radio frequency- and impedance-based sensing of ionic liquids supported on porous carriers and their limitations

Sensors and Actuators B: Chemical, **273**, 1564-1571 (2018), doi: [10.1016/j.snb.2018.07.036](https://doi.org/10.1016/j.snb.2018.07.036)

M. Bektas, T. Stöcker, A. Mergner, G. Hagen, R. Moos:

Combined resistive and thermoelectric oxygen sensor with almost temperature-independent characteristics

open access - free *Journal of Sensors and Sensor Systems*, **7**, 289-297 (2018), doi: [10.5194/jsss-7-289-2018](https://doi.org/10.5194/jsss-7-289-2018)

G. Hagen, A. Harsch, R. Moos:

A pathway to eliminate the gas flow dependency of a hydrocarbon sensor for automotive exhaust applications

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Y. Zheng, U. Sauter, R. Moos:

Oxygen transport paths in screen-printed Pt-Al₂O₃ composite model electrodes on YSZ

Solid State Ionics, **316**, 53-58 (2018), doi: [10.1016/j.ssi.2017.12.026](https://doi.org/10.1016/j.ssi.2017.12.026)

T. Ritter, G. Hagen, J. Lattus, R. Moos:

Solid state mixed-potential sensors as direct conversion sensors for automotive catalysts

Sensors and Actuators B: Chemical, **255**, 3025-3032 (2018), doi: [10.1016/j.snb.2017.09.126](https://doi.org/10.1016/j.snb.2017.09.126)

T. Ritter, S. Wiegärtner, G. Hagen, R. Moos:

Simulation of a thermoelectric gas sensor that determines hydrocarbon concentrations in exhausts and the light-off temperature of catalyst materials

Journal of Sensors and Sensor Systems, **6**, 395-405 (2017), doi: [10.5194/jsss-6-395-2017](https://doi.org/10.5194/jsss-6-395-2017)

A. Bogner, C. Steiner, S. Walter, J. Kita, G. Hagen, R. Moos:

Planar Microstrip Ring Resonators for Microwave-Based Gas Sensing: Design Aspects and Initial Transducers for Humidity and Ammonia Sensing

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M.-L. Anke, M. Hämmerle, J. Gerchau, R. Moos, A. Jess:

Radio Frequency-Based in situ Determination of the Mass Loss of Supported Ionic Liquids

Chemical Engineering and Technology, **40**, 1660-1665 (2017), doi: [10.1002/ceat.201700190](https://doi.org/10.1002/ceat.201700190)

J. Xner, G. Albrecht, D. Schönauer-Kamin, J. Kita, R. Moos:

Pulsed Polarization-Based NO_x Sensors of YSZ Films Produced by the Aerosol Deposition Method and by Screen-Printing

Sensors, **17**, 1715 (2017), doi: [10.3390/s17081715](https://doi.org/10.3390/s17081715)

I. Marr, R. Moos:

Resistive NO_x dosimeter to detect very low NO_x concentrations – Proof-of-principle and comparison with classical sensing devices

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G. Hagen, N. Leupold, S. Wiegärtner, R. Moos:

Sensor Tool for Fast Catalyst Material Characterization

Topics in Catalysis, **60**, 312-317 (2017), doi: [10.1007/s11244-016-0617-8](https://doi.org/10.1007/s11244-016-0617-8)

M. Feulner, G. Hagen, K. Hottner, S. Redel, A. Müller, R. Moos:

Comparative Study of Different Methods for Soot Sensing and Filter Monitoring in Diesel Exhausts

Sensors, **17**, 400 (2017), doi: [10.3390/s17020400](https://doi.org/10.3390/s17020400)

R. Moos, D. Rauch, M. Votsmeier, D. Kubinski:

Review on Radio Frequency Based Monitoring of SCR and Three Way Catalysts

Topics in Catalysis, **59**, 961-969 (2016), doi: [10.1007/s11244-016-0575-1](https://doi.org/10.1007/s11244-016-0575-1)

Y. Zheng, U. Sauter, R. Moos:

Investigation of Oxygen Transport Paths in Geometrically Defined Thick-Film Composite Pt Electrodes on YSZ

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J. Xner, M. Schubert, D. Hanft, T. Stöcker, P. Fuierer, R. Moos:

Tuning of the electrical conductivity of Sr(Ti,Fe)O₃ oxygen sensing films by aerosol co-deposition with Al₂O₃

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Platform to develop exhaust gas sensors manufactured by glass-solder-supported joining of sintered yttria-stabilized zirconia

Journal of Sensors and Sensor Systems, **5**, 25-32 (2016), doi: [10.5194/jsss-5-25-2016](https://doi.org/10.5194/jsss-5-25-2016)

T. Simons, P. Chen, D. Rauch, R. Moos, U. Simon:

Sensing Catalytic Conversion: Simultaneous DRIFT and Impedance Spectroscopy for *in situ* Monitoring of DeNO_x-SCR on Zeolites

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Influence of operation temperature variations on NO measurements in low concentrations when applying the pulsed polarization technique to thimble-type lambda probes

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Correlating the Integral Sensing Properties of Zeolites with Molecular Processes by Combining Broadband Impedance and DRIFT Spectroscopy—A New Approach for Bridging the Scales

Sensors, **15**, 28915-28941 (2015), doi: [10.3390/s151128915](https://doi.org/10.3390/s151128915)

P. Fremerey, A. Jess, R. Moos:

Why does the Conductivity of a Nickel Catalyst Increase during Sulfidation? An Exemplary Study Using an *In Operando* Sensor Device
Sensors, **15**, 27021-27034 (2015), doi: 10.3390/s151027021

M. Dietrich, C. Jahn, P. Lanzerath, R. Moos:
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Sensors, **15**, 21971-21988 (2015), doi: 10.3390/s150921971

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G. Hagen, K. Burger, S. Wiegärtner, D. Schönauer-Kamin, R. Moos:
A mixed potential based sensor that measures directly catalyst conversion - A novel approach for catalyst on-board diagnostics
Sensors and Actuators B: Chemical, **217**, 158-164 (2015), doi: 10.1016/j.snb.2014.10.004

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Influence of the V₂O₅ content of the catalyst layer of a non-Nernstian NH₃ sensor
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Solid State Ionics, **262**, 288-291 (2014), doi: 10.1016/j.ssi.2014.01.022

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