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Date of Birth: 06.08.1975

**Education and Professional Experience**

1995 bis 1998	Master of Science (MSc) in Physical Chemistry, Goa University, India
1998 bis 2000	Lecturer in Physical Chemistry, Goa University, India
2000 bis 2004	Research Assistant, Karlsruhe Institute of Technology
12 / 2003	PhD (Dr. rer.nat.) in Physical Chemistry, Karlsruhe Institute of Technology
2004 bis 2007	Postdoc, Max-Planck-Institute of Biophysical Chemistry and University of Göttingen
2007 bis 2009	Postdoc, Sandia National Laboratories, Livermore, USA
2009 bis 2013	Professor (W1) „Physico Chemical Fundamentals of Combustion“, RWTH Aachen
2012 bis 2013	JSPS Visiting Professor, Chemical Engineering, University of Tokyo, Japan
since 04 /2013	Head of Department for Physical Chemistry, Physikalisch-Technische Bundesanstalt
since 2014	Honorary Professor, Mechanical Engineering, Technical University of Braunschweig
since 2015	Director and Professor (B2), Physikalisch-Technische Bundesanstalt
since 2021	Honorary Professor, Mechanical Engineering, Indian Institute of Technology Guwahati

Academic Distinctions

03.2004-12.2006	Max-Planck Fellowship for postdoctoral research at Max-Planck Institute, Göttingen, Germany
2010	Distinguished paper award for the 32 nd International Symposium on Combustion
2012	Award of JSPS Visiting Professorship at the University of Tokyo, Japan
06.2015	Conferred the Title of “Director & Professor” by the then Federal President of Germany, Dr. Joachim Gauck
2016-present	Chairman of the Technical Committee on “Measurements of Energy and Related Quantities” of the International Measurement Confederation
2016-present	Member of the Editorial Board for the Journal “Measurement”
2019-present	Member of the Advisory Board of the DIN (German Institute of Standards) Committee for Materials Testing (FAM)

Research Areas and Interests

- Reaction Kinetics in the gas phase (Energy conversion and Atmospheric Chemistry)
- Metrology for fluid energy carriers
- Physico Chemical fundamentals of Combustion
- Fuel characterization and Material Properties
- Spectroscopy and Photochemical Kinetics
- Laser diagnostics in Combustion
- High temperature process measurements

Selected Collaborative Projects (completed and ongoing)

- [1] BMBF- INNO INDIGO (EU-INDIA Project): Towards higher efficiencies and lower emissions for Indian-origin biodiesel combustion: Developing a predictive CFD model with validated reduced kinetics for device-scale applications (2017 - 2020)
- [2] EU Project (EMRP-ENG 60-LNGII): Metrological support for LNG custody transfer and transport fuel applications (2014 - 2017)
- [3] EU Project (EMPIR 16ENG09-LNGIII): Metrological support for LNG and LBG as transport fuel, (2017 - 2020)
- [4] DFG-Excellence Cluster EXC 2163: SE2A Sustainable and Energy Efficient Aviation (2019-2027)
- [5] Innovation Laboratory Hydrogen- State of Lower Saxony Initiative (2020-2024)
- [6] State of Lower Saxony - Graduate School for Hydrogen and Hydrogen Derivative Ammonia (2024-2028)
- [7] EU Project (EMN) Thermometry with embedded SI traceability for industrial applications (2024-2027)
- [8] Industry (Tecosol GmbH) Project: Thermophysical Characteristics of Alternative Fuels (2023-2026)
- [9] DFG Research Group ExRef: Experimental investigation on the oxidation and pyrolysis kinetics of fluorinated refrigerants (2024-2027)
- [10] EURAMET Project MaritimeMET: Metrology for Green Maritime Shipping - Emission control through traceable measurements and machine learning approach (2024-2027)

Selected Publications

- [1] FERNANDES, R; LUTHER, K.; TROE, J.; USHAKOV, V.: Experimental and modeling study of the reaction $\text{H} + \text{O}_2 (+\text{M}) \rightarrow \text{HO}_2 (+\text{M})$ between 300 and 900 K, 1.5 and 950 bar, and in the bath gases $\text{M} = \text{He}, \text{Ar}, \text{N}_2$. Physical Chemistry Chemical Physics. 10, 4313- 4321 (2008)
- [2] FERNANDES, R; ZADOR, J.; JUSINSKI, L.; MILLER, J.; TAATJES, C.: Formally direct pathways and low-temperature chain branching in hydrocarbon autoignition: The cyclohexyl + O_2 reaction at high pressure. Physical Chemistry Chemical Physics, 11, 1320-1329 (2009)
- [3] ZADOR, J.; TAATJES, C.; FERNANDES, R.: Kinetics of Elementary Reactions in Autoignition Chemistry. Progress in Energy and Combustion Science, 37, 371-421 (2011)
- [4] WELZ, O.; ZADOR, J.; SAVEE, J.; Ng. M.; MELONI G.; FERNANDES, R, SHEPS, L.; SIMMONS, B.; OSBORN, D.; TAATJES, C.: Low-Temperature Combustion Chemistry of Biofuels: Pathways in the Initial Low-Temperature (550 K-750 K) Oxidation Chemistry of Isopentanol. Physical Chemistry Chemical Physics, 14, 3112-3127 (2012)
- [5] CHAKRAVARTY, H.; FERNANDES, R.: Reaction Kinetics of Hydrogen Abstraction Reaction by Hydroperoxyl Radical from 2-Methyltetrahydrofuran and 2,5-Dimethyltetrahydrofuran. Journal of Physical Chemistry A, 117, 5028-5041 (2013)
- [6] VRANCKX, S.; BEECKMANN, J.; KOPP, W.; LEE, C.; CAI, L.; CHAKRAVARTY, H.; OLIVIER, H.; LEONARD, K.; PITSCH, H.; FERNANDES, R.: An experimental and kinetic modeling study of n-butyl formate combustion.

Combustion and Flame, 160, 2680-2692 (2013)

[7] PARAB, P.; HEUFER, K.; FERNANDES, R: Reaction kinetics of hydrogen atom abstraction from isopentanol by the H atom and HO₂[·] radical. Physical Chemistry Chemical Physics, 20, 10895-10905 (2018)

[8] VALLABHUNI, S.; LELE, A.; PATEL, V.; LUCASSEN, A.; MOSHAMMER, K.; ALABBAD, M; Farooq, A.; FERNANDES, R.: Autoignition studies of Liquefied Natural Gas (LNG) in a shock tube and a rapid compression machine, Fuel, 232, 423-4308 (2018)

[9] LELE, A.; VALLABHUNI, S.; MOSHAMMER, K.; FERNANDES, R; KRISHNASAMY, A.; NARAYANASWAMY, K.: Experimental and chemical kinetic modeling investigation of methyl butanoate as a component of biodiesel surrogate, Combustion and Flame, 197, 49-64 (2018)

[10] HE, X.; SHU, B.; NASCIMENTO, D.; MOSHAMMER, K.; COSTA, M.; FERNANDES, R.: Auto-ignition kinetics of ammonia and ammonia/hydrogen mixtures at intermediate temperatures and high pressures. Combustion and Flame. 206, 189-200 (2019)

[11] NADIRI, S.; ZIMMERMANN, P.; SANE, L.; FERNANDES, R.; DINKELACKER, F.; SHU, B.: Kinetic Modeling Study on the Combustion Characterization of Synthetic C3 and C4 Alcohols for Lean Premixed Prevaporized Combustion. Energies. 14, 5473-5499 (2021)

[12] AGARWAL, S.; SANE, L.; FERNANDES, R.; SHU, B.: MID-IR laser absorption spectroscopy of 1- and 2-butanol in a shock tube facility. Combustion and Flame. 243, 112087-112100 (2022)

[13] DA COSTA, S.; SALKAR, A.; KRISHNASAMY, A.; FERNANDES, R.; MORAJKAR, P.: Investigating the oxidative reactivity and nanostructural characteristics of diffusion flame generated soot using methyl crotonate and methyl butyrate blended diesel fuels. Fuel. 309, 122141-122158 (2022)

[14] NADIRI, S.; SHU, B.; GOLDSMITH F.; FERNANDES, R.: Development of comprehensive kinetic models of ammonia/methanol ignition using Reaction Mechanism Generator (RMG) 251, 112710 -112726 (2023)

[15] ZHU, D.; SEIFERT, L.; AGARWAL, S.; SHU B.; FERNANDES, R.; QU Z.: NH₃ line broadening coefficients and intensities measurement and impurities determination in emerging applications: CCUS, Biomethane and H₂ Spectrochimica Acta. 320, 124642-124646 (2024)