



Smart Cities and Infrastructure

Digital Production and Products – Industry 4.0



Future Mobility

Business Opportunities for German and Korean Companies

Energy for our Future

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Reliable, Flexible, and Efficient Energy Conversion via Solid Oxide Cells

Solid Oxide Cells based on ceramic electrolytes are very efficient high-temperature electrochemical devices which can be used reversibly. On the one hand, fuels are converted into electricity (fuel cell mode) or on the other hand, excess electricity enables to electrolyze water vapor or carbon dioxide to synthesize fuels and basic chemicals (hydrogen, carbon monoxide). After a general overview on this emerging technology, including materials and processing techniques, recent results on fuel flexibility (including biogas, not only pure hydrogen) and reliability (long life-time achieved through mitigation of degradation processes) will be presented.

- From 02/2014: Director of IEK-1 and Full Professor at RWTH Aachen University (Materials Synthesis for the Energy)
- 02-04/2013; 10/2015: Guest professor, Tokyo Institute of Technology, Japan
- 10/2011-02/2014: Professor of „Mechanics of functional materials“, Friedrich-Schiller-Universität Jena, Germany
- 01/2007: Head of Emmy Noether Group „New ceramic processes and their mechanical characterization“, TU Darmstadt, Germany
- 07-12/2006: Visiting scientist at University of Washington, USA (Prof. R. Bordia)
- 09/2004-12/2006: Post-doc, Ceramics Group, TU Darmstadt (Prof. J. Rödel)
- 2003-2004: Assistant, Laboratory of Electrical Engineering and Ferroelectricity, INSA Lyon, France
- 10/2000-09/2003: PhD thesis with honors „Electromechanical characterisation and modelling of PZT ferroelectric ceramics“, Laboratory of Applied Mechanics, University of Franche-Comté, France
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