Ming Chen - DTU Orbit (30/01/2019)

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Solid State Chemistry

Research outputs:

**Phase Field Modelling of Microstructural Changes in Ni/YSZ Solid Oxide Electrolysis Cell Electrodes**

Research output: Research - peer-review › Article in proceedings – Annual report year: 2019

**Characterization of three dimensional transport networks in a long-term tested solid oxide electrolysis cell**

Research output: Research - peer-review › Conference abstract for conference – Annual report year: 2018

**Comparison between La$_{0.6}$Sr$_{0.4}$CoO$_{3-d}$ and LaNi$_{0.6}$Co$_{0.4}$O$_{3-d}$ infiltrated oxygen electrodes for long-term durable solid oxide fuel cells**

Research output: Research - peer-review › Journal article – Annual report year: 2018

**Diffusion rates of reactants and components in solid oxide cells**

Research output: Research - peer-review › Article in proceedings – Annual report year: 2018

**Numerical simulation of kinetic demixing and decomposition in a LaCoO$_{3-d}$ oxygen membrane under an oxygen potential gradient**

Research output: Research - peer-review › Journal article – Annual report year: 2018

**Oxidation behavior of a Ni-Fe support in SOFC anode atmosphere**
Xu, N., Chen, M. & Han, M. 2018 In : Journal of Alloys and Compounds. 765, p. 757-763

Research output: Research - peer-review › Journal article – Annual report year: 2018

**Post-mortem analysis of a 25-cell solid oxide electrolysis stack operated for 9000 hours**

Research output: Research › Conference abstract for conference – Annual report year: 2018

**Sintering of MnCo$_2$O$_4$ coatings prepared by electrophoretic deposition**

Research output: Research - peer-review › Journal article – Annual report year: 2018

**Durable fuel electrode**

Research output: Research › Patent – Annual report year: 2017

**A Contribution to the Understanding of the Combined Effect of Nitrogen and Boron in Grey Cast Iron**

Research output: Research - peer-review › Journal article – Annual report year: 2017
A Decade of Solid Oxide Electrolysis Improvements at DTU Energy
Research output: Research - peer-review › Conference article – Annual report year: 2017

Analysis of Gas Leakage and Current Loss of Solid Oxide Fuel Cells by Screen Printing
Jia, C., Han, M. & Chen, M. 2017 In : ECS Transactions. 78, 1, p. 1533-1540
Research output: Research - peer-review › Journal article – Annual report year: 2017

Analysis of Gas Leakage and Current Loss of Solid Oxide Fuel Cells by Screen Printing
Research output: Research - peer-review › Conference abstract in journal – Annual report year: 2017

Application of numerical inverse method in calculation of composition-dependent interdiffusion coefficients in finite diffusion couples
Research output: Research - peer-review › Journal article – Annual report year: 2017

Concentration Impedance in Testing of Solid Oxide Cells Revisited
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Concentration Impedance in Testing of Solid Oxide Cells Revisited
Research output: Research - peer-review › Journal article – Annual report year: 2017

High performance LaNi1-xCoxO3-δ (x = 0.4 to 0.7) infiltrated oxygen electrodes for reversible solid oxide cells
Research output: Research - peer-review › Journal article – Annual report year: 2017

In-situ formed Ce0.8Gd0.2O1.9 barrier layers on yttria stabilized zirconia backbones by infiltration - A promising path to high performing oxygen electrodes of solid oxide cell
Research output: Research - peer-review › Journal article – Annual report year: 2017

Life cycle assessment of hydrogen production from water electrolysis
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Mechanical Properties of Supports and Half-Cells for Solid Oxide Electrolysis Influenced by Alumina-Zirconia Composites
Research output: Research - peer-review › Journal article – Annual report year: 2016

Microstructural Characterization of Ni/YSZ Electrodes in a Solid Oxide Electrolysis Stack Tested for 9000 Hours
Research output: Research - peer-review › Journal article – Annual report year: 2017

Microstructural Characterization of Ni/YSZ Electrodes in a Solid Oxide Electrolysis Stack Tested for 9000 Hours
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017
Modeling of Ni Diffusion Induced Austenite Formation in Ferritic Stainless Steel Interconnects
Research output: Research - peer-review › Journal article – Annual report year: 2017

Performance and electrochemical analysis of solid oxide fuel cells based on LSCF-YSZ nano-electrode
Research output: Research - peer-review › Journal article – Annual report year: 2017

Pressurized reversible operation of a 30-cell solid oxide cell stack using carbonaceous gases
Research output: Research - peer-review › Article in proceedings – Annual report year: 2017

Relation Between Ni Particle Shape Change and Ni Migration in Ni–YSZ Electrodes – a Hypothesis
Research output: Research - peer-review › Journal article – Annual report year: 2017

Spinel-based coatings for metal supported solid oxide fuel cells
Research output: Research - peer-review › Journal article – Annual report year: 2017

Thermoneutral Operation of Solid Oxide Electrolysis Cells in Potentiostatic Mode
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Thermoneutral Operation of Solid Oxide Electrolysis Cells in Potentiostatic Mode
Research output: Research - peer-review › Journal article – Annual report year: 2017

Towards long-term stable solid state electrolyzers with infiltrated catalysts
Ovtar, S., Chen, M., Brodersen, K., Hauch, A., Sun, X., Bentzen, J. J. & Hendriksen, P. V. 2017 1 p.
Research output: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Towards solid oxide electrolysis plants in 2020
Research output: Research › Poster – Annual report year: 2018

A contribution to the understanding of the combined effect of nitrogen and boron in grey cast iron
Research output: Research - peer-review › Article in proceedings – Annual report year: 2017

A Decade of Improvements for Solid Oxide Electrolysis Cells. Long-Term Degradation Rate from 40%/Kh to 0.4 % Kh
Research output: Research - peer-review › Conference abstract in journal – Annual report year: 2016
An Ag based brazing system with a tunable thermal expansion for the use as sealant for solid oxide cells
Research output: Research - peer-review › Journal article – Annual report year: 2016

Characterisation of a Planar Solid Oxide Cell Stack Operated at Elevated Pressure
Research output: Research - peer-review › Conference abstract in journal – Annual report year: 2016

Characterization of a Planar Solid Oxide Cell Stack Operated at Elevated Pressure
Research output: Research - peer-review › Conference article – Annual report year: 2016

Effects of strong cathodic polarization of the Ni-YSZ interface
Research output: Research - peer-review › Journal article – Annual report year: 2016

Electrochemical Impedance Spectroscopy on Industrially-Relevant Solid Oxide Electrolyzer Cell Stacks: A Powerful Tool for in-Situ Investigations of Degradation Mechanisms
Research output: Research - peer-review › Conference abstract in journal – Annual report year: 2016

High-Performance Microchanneled Asymmetric Gd_{0.1}Ce_{0.9}O_{1.95-δ-La_{0.6}Sr_{0.4}FeO_{3-δ}}-Based Membranes for Oxygen Separation
Research output: Research - peer-review › Journal article – Annual report year: 2016

in-Situ Formed Ce_{0.8}Gd_{0.2}O_{1.9} Barrier Layer on Yttria Stabilized Zirconia Back-Bone for Infiltrated Oxygen Electrodes
Research output: Research - peer-review › Conference abstract in journal – Annual report year: 2016

Long-term operation of a solid oxide cell stack for coelectrolysis of steam and CO_{2}
Research output: Research - peer-review › Article in proceedings – Annual report year: 2016

Low temperature processed MnCo_{2}O_{4} and MnCo_{1.8}Fe_{0.2}O_{4} as effective protective coatings for solid oxide fuel cell interconnects at 750 °C
Research output: Research - peer-review › Journal article – Annual report year: 2016

Ni/YSZ electrodes structures optimized for increased electrolysis performance and durability
Research output: Research - peer-review › Journal article – Annual report year: 2016

Phase diagram for a nano-yttria-stabilized zirconia system
Research output: Research - peer-review › Journal article – Annual report year: 2016
Stability of La$_{0.6}$Sr$_{0.4}$Co$_{0.2}$Fe$_{0.8}$O$_3$/Ce$_{0.9}$Gd$_{0.1}$O$_2$ cathodes during sintering and solid oxide fuel cell operation
Research output: Research - peer-review › Journal article – Annual report year: 2015

Ceria based protective coatings for steel interconnects prepared by spray pyrolysis
Szymczewska, D., Molin, S., Chen, M., Hendriksen, P. V. & Jasinski, P. 2014 In : Procedia Engineering. 98, p. 93 – 100
Research output: Research - peer-review › Conference article – Annual report year: 2015

Durability of high performance Ni-yttria stabilized zirconia supported solid oxide electrolysis cells at high current density
Research output: Research - peer-review › Journal article – Annual report year: 2014

Durable solid oxide electrolysis cells for hydrogen production
Research output: Research - peer-review › Article in proceedings – Annual report year: 2014

Electrochemistry Unlocks Wettability: Epitaxial Growth of Oxide Nanoparticles on Rough Metallic Surfaces
Research output: Research - peer-review › Journal article – Annual report year: 2014

Electron microscopy investigation of electrochemically enabled wetting of Y stabilized zirconia on Ni
Research output: Research - peer-review › Conference abstract for conference – Annual report year: 2014

Electron microscopy investigation of electrochemically enabled wetting of Y stabilized zirconia on Ni
Research output: Research - peer-review › Poster – Annual report year: 2014

Electron microscopy investigation of electrochemically enabled wetting of Y stabilized zirconia on Ni
Research output: Research - peer-review › Conference abstract for conference – Annual report year: 2014

Electron microscopy investigation of electrochemically enabled wetting of Y stabilized zirconia on Ni
Research output: Research - peer-review › Poster – Annual report year: 2014

Influence of Mn-Co Spinel Coating on Oxidation Behavior of Ferritic SS Alloys for SOFC Interconnect Applications
Research output: Research - peer-review › Article in proceedings – Annual report year: 2014

NiYSZ microstructure optimization for long-term stability of solid oxide electrolysis cells
Research output: Research - peer-review › Article in proceedings – Annual report year: 2014

Optimization of Ferritic Steel Porous Supports for Protonic Fuel Cells Working at 600°C
Research output: Research - peer-review › Article in proceedings – Annual report year: 2014

Optimization of Ferritic Steel Porous Supports for Protonic Fuel Cells Working at 600°C
Research output: Research - peer-review › Article in proceedings – Annual report year: 2014
Influence of the oxygen electrode and inter-diffusion barrier on the degradation of solid oxide electrolysis cells
Research output: Research - peer-review › Journal article – Annual report year: 2013

Microstructural Degradation of Ni/YSZ Electrodes in Solid Oxide Electrolysis Cells under High Current
Research output: Research - peer-review › Journal article – Annual report year: 2013

Microstructure characterisation of solid oxide electrolysis cells operated at high current density
Research output: Research - peer-review › Conference abstract for conference – Annual report year: 2013

Reversible solid oxide cells: Limitations and possibilities
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2014

Reversible Solid Oxide Cells: Limitations and Possibilities
Research output: Research › Sound/Visual production (digital) – Annual report year: 2013

Thermodynamic modeling of the Co-Fe-O system
Zhang, W. & Chen, M. 2013 In : C A L P H A D. 41, p. 76-88
Research output: Research - peer-review › Journal article – Annual report year: 2013

Transmission Electron Microscopy Specimen Preparation Method for Multiphase Porous Functional Ceramics
Research output: Research - peer-review › Journal article – Annual report year: 2013

Development of SOEC Cells and Stacks: Highlights, Challenges and future Perspectives
Research output: Research › Sound/Visual production (digital) – Annual report year: 2012

Durable and Robust Solid Oxide Fuel Cells
Research output: Research › Report – Annual report year: 2013

Efficient dual layer interconnect coating for high temperature electrochemical devices
Research output: Research - peer-review › Journal article – Annual report year: 2012

High Temperature Co-electrolysis of Steam and CO2 in an SOC stack: Performance and Durability
Research output: Research - peer-review › Article in proceedings – Annual report year: 2012

Improved oxidation resistance of ferritic steels with LSM coating for high temperature electrochemical applications
Microstructure degradation of LSM-YSZ cathode in SOFCs operated at various conditions
Research output: Research - peer-review › Conference article – Annual report year: 2012

Performance and Durability of Solid Oxide Electrolysis Cells for Syngas Production
Research output: Research - peer-review › Conference article – Annual report year: 2012

Thermodynamic analysis of synthetic hydrocarbon fuel production in pressurized solid oxide electrolysis cells
Research output: Research - peer-review › Journal article – Annual report year: 2012

Thermodynamic modeling of La2O3-SrO-Mn2O3-Cr2O3 for solid oxide fuel cell applications
Research output: Research - peer-review › Journal article – Annual report year: 2012

Electrical conductivity of Ni–YSZ composites: Degradation due to Ni particle growth
Research output: Research - peer-review › Journal article – Annual report year: 2011

Electrolysis for Integration of Renewable Electricity and Routes towards Sustainable Fuels
Research output: Research › Article in proceedings – Annual report year: 2011

High Temperature Electrolysis of Steam and CO2 in Solid Oxide Cells
Research output: Research - peer-review › Conference abstract for conference – Annual report year: 2011

Performance and durability of solid oxide electrolysis cells for syngas production
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2011

The Effect of Humidity and Oxygen Partial Pressure on LSM–YSZ Cathode
Research output: Research - peer-review › Journal article – Annual report year: 2011

A Composite Glass Seal for a Solid Oxide Electrolyser Cell Stack
Research output: Research › Patent – Annual report year: 2010

Corrosion stability of ferritic stainless steels for solid oxide electrolyser cell interconnects
Palcut, M., Mikkelsen, L., Neufeld, K., Chen, M., Knibbe, R. & Hendriksen, P. V. 2010 In : Corrosion Science. 5210, 3309-3320
Research output: Research - peer-review › Journal article – Annual report year: 2010
Investigation of Failure Mechanisms in Ti containing Brazing Alloys used in SOFC/SOEC Environments
Research output: Research - peer-review › Article in proceedings – Annual report year: 2011

Phase Formation in the System ZrO2–LaO1.5–MnOx in Air and PO2B1 Pa After 500 h of Annealing at 12001 and 14001 deg.C
Chatzichristodoulou, C., Chen, M., Bowen, J. R. & Liu, Y-L. 2010 In : Journal of the American Ceramic Society. 93, 9, p. 2884-2890
Research output: Research - peer-review › Journal article – Annual report year: 2010

Removal of impurity phases from electrochemical devices
Research output: Research › Patent – Annual report year: 2010

Stability of Ni–yttria stabilized zirconia anodes based on Ni-impregnation
Research output: Research - peer-review › Journal article – Annual report year: 2010

TEM Investigations on Cathode Degradation in Solid Oxide Fuel Cells
Research output: Research - peer-review › Article in proceedings – Annual report year: 2010

Thermodynamic assessment of the CoOx-CrO1.5 system (vol 485, pg 427, 2009)
Research output: Research - peer-review › Journal article – Annual report year: 2010

Effect of Humidity in Air on Performance and Long-term Durability of SOFCs
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2009

Effect of Humidity in Air on Performance and Long-Term Durability of SOFCs
Research output: Research - peer-review › Conference article – Annual report year: 2009

LSM-YSZ Reactions in Different Atmospheres
Research output: Research - peer-review › Journal article – Annual report year: 2009

Microstructural studies on degradation of interface between LSM–YSZ cathode and YSZ electrolyte in SOFCs
Research output: Research - peer-review › Journal article – Annual report year: 2009

Thermodynamic assessment of the CoOx-CrO1.5 system
Research output: Research - peer-review › Journal article – Annual report year: 2009

Thermodynamic Assessment of the La-Cr-O System
Research output: Research - peer-review › Journal article – Annual report year: 2009
Thermodynamic assessment of the La-Fe-O system
Research output: Research - peer-review › Journal article – Annual report year: 2009

Degradation mechanisms on LSM/YSZ electrodes
Hendriksen, P. V., Liu, Y-L., Chen, M., Barfod, R., Poulsen, F. W. & Hagen, A. 2008
Research output: Research › Paper – Annual report year: 2008

Modelling of oxides for use in high temperature fuel cells
Research output: Research - peer-review › Article in proceedings – Annual report year: 2008

Thermodynamics and phase equilibria in the ZrO2-61485; La=1.5 system
Chen, M. 2008
Research output: Research › Paper – Annual report year: 2008

Deposition of La0.8Sr0.2Cr0.97V0.03O3 and MnCr2O4 thin films on ferritic alloy for solid oxide fuel cell application
Research output: Research - peer-review › Conference article – Annual report year: 2007

LSM-YSZ interface reactions during long-term heat treatment
Research output: Research › Paper – Annual report year: 2007

Reaction thermodynamics at the LSM-YSZ interface in SOFCs
Research output: Research › Paper – Annual report year: 2007

Thermodynamic evaluation of the CoOx-Cr2O3 system
Research output: Research › Poster – Annual report year: 2007

Thermodynamic modeling of the LaMnO3-YSZ interface reactions using the CALPHAD approach
Research output: Research › Conference abstract for conference – Annual report year: 2006

Thermodynamic modeling of the La-Mn-Y-Zr-O system
Research output: Research - peer-review › Journal article – Annual report year: 2006

Projects:

Durable and high performing steam electrode for proton conducting solid oxide cells
Wang, Q., Chen, M., Hendriksen, P. V. & Ricote, S.
01/01/2019 → 31/12/2021
Project: PhD

Novel Cobalt Free Oxygen Electrodes for Solid Oxide Electrolysis Cells
Tong, X., Chen, M., Hendriksen, P. V. & Ovtar, S.
Stipendie fra udlandet
Modeling of degradation processes in high temperature electrolysis cells
Trini, M., Chen, M., Hauch, A. & Hendriksen, P. V.
Forskningsrådssamfinansiering
01/09/2016 → 31/08/2019
Project: PhD

Degradation mechanism of the LSCF Cathode
Zhang, W., Chen, M., Barfod, R. G., Hendriksen, P. V., Hjelm, J., Hallstedt, B. & Markus, T.
DTU, Samfinansiering
15/04/2010 → 19/03/2013
Project: PhD

Activities:

Reversible Operation using Carbonaceous Gasses of a 30-cell Solid Oxide Cell Stack
Jensen, S. H. (Guest lecturer), Langnickel, H. (Guest lecturer), Nils Hintzen (Other), Chen, M. (Guest lecturer), Sun, X. (Guest lecturer), Hauch, A. (Guest lecturer), Butera, G. (Guest lecturer), Clausen, L. R. (Guest lecturer)
12 Dec 2017 → 15 Dec 2017
Activity: Talks and presentations › Conference presentations

Towards solid oxide electrolysis plants in 2020
Chen, M. (Other)
28 Nov 2017
Activity: Talks and presentations › Conference presentations

Thermoneutral Operation of Solid Oxide Electrolysis Cells In Potentiostatic Mode
Chen, M. (Other)
23 Jul 2017 → 28 Jul 2017
Activity: Talks and presentations › Conference presentations

Solid Oxide Electrolysis for Grid Balancing: Recent Achievements and Future Challenges
Chen, M. (Speaker)
13 Jun 2017 → 15 Jun 2017
Activity: Talks and presentations › Conference presentations

Materials Science & Technology 2016 (MS&T16) conference
Chen, M. (Invited speaker)
Activity: Talks and presentations › Conference presentations

69th Annual Gaseous Electronics Conference
Chen, M. (Invited speaker)
10 Oct 2016
Activity: Talks and presentations › Conference presentations

Denmark-China Bilateral Workshop on Energy Conversion and Storage
Chen, M. (Organizer)
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

12th European SOFC & SOE Forum 2016
Chen, M. (Speaker)
5 Jul 2016 → 8 Jul 2016
Hydrogen2Storage & Transport in Denmark
Chen, M. (Participant)
8 Jun 2016

Sino-Denmark Bilateral Forum: Possibilities and Challenges of Solid Oxide Cells in Energy Transition
Chen, M. (Organizer)
8 Apr 2016 → 11 Apr 2016

Chemical thermodynamics in CO2 capture and electrolysis
Chen, M. (Speaker)
12 Apr 2011

Prizes:

Third Price EFC17 Best Paper Awards
Søren Højgaard Jensen (Recipient), Hendrik Langnickel (Recipient), Nils Hintzen (Recipient), Ming Chen (Recipient), Xiufu Sun (Recipient), Anne Hauch (Recipient), Giacomo Butera (Recipient) & Lasse Røngaard Clausen (Recipient), 13 Dec 2017
Prize: Prizes, scholarships, distinctions