

Begutachtete Artikel in ISI-gelisteten Zeitschriften

2019

76. C. Kupper, S. Spitznagel, H. Döring, M. A. Danzer, C. Gutierrez, A. Kvashad, W. G. Bessler, "Combined modeling and experimental study of the high-temperature behavior of a lithium-ion cell: Differential scanning calorimetry, accelerating rate calorimetry and external short circuit", *Electrochim. Acta* 306, 209-219 (2019), DOI: 10.1016/j.electacta.2019.03.079

2018

75. C. Kupper, B. Weißhar, S. Reißmann, and W. G. Bessler, "End-of-life prediction of a lithium-ion battery cell based on mechanistic aging models of the graphite electrode" *J. Electrochem. Soc.* 165, A3468-A3480 (2018), DOI: 10.1149/2.0941814jes.

74. R. J. Kee, P. Weddle, H. Zhu, G. Jackson, A. Colclasure, W. G. Bessler, and S. DeCaluwe, "On the fundamental and practical aspects of modeling complex electrochemical kinetics and transport", *J. Electrochem. Soc.* 165, E637-E658 (2018), DOI: 10.1149/2.041813jes.

73. M. Mayur, M. Gerard, P. Schott, and W. G. Bessler, "Lifetime prediction of a Polymer Electrolyte Membrane fuel cell under automotive load cycling using a physically-based catalyst degradation model," *Energies*, 11, 2054 (2018), DOI: 10.3390/en11082054

72. F. Hall, J. Touzri, S. Wußler, H. Buqa, and W. G. Bessler, "Experimental Investigation of the Thermal and Cycling Behavior of a Lithium Titanate-based Lithium-ion Pouch Cell," *J. Energy Storage* 17, 109-117 (2018), DOI: 10.1016/j.est.2018.02.012.

2017

71. B. Weißhar and W. G. Bessler, "Model-Based Lifetime Prediction of an LFP/Graphite Lithium-ion Battery in a Stationary Photovoltaic Battery System," *J. Energy Storage* 14, 179-191, DOI: 10.1016/j.est.2017.10.002 (2017).

70. M. Mayur and W. G. Bessler, "Two-Dimensional Computational Fluid Dynamics Analysis of Transport Limitations of Different Electrolyte Systems in a Lithium-Air Button Cell Cathode," *J. Electrochem. Soc.* 164, E3489-E3498, DOI: 10.1149/2.0451711jes (2017).

69. T. Jahnke, M. Zago, A. Casalegno, W. G. Bessler, and A. Latz, "A transient multi-scale model for direct-methanol fuel cells," *Electrochim. Acta* 232, 215-225, DOI: 10.1016/j.electacta.2017.02.116 (2017).

68. S. Joos, B. Weißhar, and W. G. Bessler, "Passive hybridization of a photovoltaic module with lithium-ion battery cells: A model-based analysis," *J. Power Sources* 348, 201-211, DOI: 10.1016/j.jpowsour.2017.02.063 (2017).

67. C. Kupper and W. G. Bessler, "Multi-Scale Thermo-Electrochemical Modeling of Performance and Aging of a LiFePO₄/Graphite Lithium-Ion Cell," *J. Electrochem. Soc.* 164, A304-A320, DOI: 10.1149/2.0761702jes (2017).

2016

66. D. Grübl, B. Bergner, D. Schröder, J. Janek, and Wolfgang G. Bessler, "Multi-Step Reaction Mechanisms in Non-Aqueous Lithium-Oxygen Batteries with Redox Mediator: A Model-Based Study," *J. Phys. Chem. C* 120 (43), 24623-24636, DOI: 10.1021/acs.jpcc.6b07886 (2016).

65. F. Hall, S. Wußler, H. Buqa, and W. G. Bessler, "On the asymmetry of discharge/charge curves of lithium-ion battery intercalation electrodes," *J. Phys. Chem. C*, 120 (41), 23407-23414, DOI: 10.1021/acs.jpcc.6b07949 (2016).

64. D. Grübl, J. Janek, and W. G. Bessler, "Electrochemical pressure impedance spectroscopy (EPIS) as diagnostic method for electrochemical cells with gaseous reactants: A model-based analysis," *J. Electrochem. Soc.* 163, A599-A610, DOI: 10.1149/2.1041603jes (2016).

63. T. Jahnke, G. Futter, A. Latz, T. Malkow, G. Papakonstantinou, G. Tsotridis, P. Schott, M. Gérard, M. Quinaud, M. Quiroga, A.A. Franco, K. Malek, F. Calle-Vallejo, R. Ferreira de Morais, T. Kerber, P. Sautet, D. Loffreda, S. Strahl, M. Serra, P. Polverino, C. Pianese, M. Mayur, W. G. Bessler, and C. Kompis, "Performance and degradation of Proton Exchange Membrane Fuel Cells: State of the art in modeling from atomistic to system scale," *J. Power Sources* 304, 207-233, DOI: 10.1016/j.jpowsour.2015.11.041 (2016).

62. S. Lueth, U. S. Sauter, and W. G. Bessler, "An agglomerate model of lithium-ion battery cathodes," *J. Electrochem. Soc.* 163, A210-A222, DOI: 10.1149/2.0291602jes (2016).

2015

61. M. Mayur, S. Strahl, A. Husar, and W. G. Bessler, "A multi-timescale modeling methodology for PEMFC performance and durability in a virtual fuel cell car," *Int. J. Hydrogen Energy* 40, 16466-16476, DOI: 10.1016/j.ijhydene.2015.09.152 (2015).

60. D. Grübl and W. G. Bessler, "Cell design concepts for aqueous lithium oxygen batteries: A model-based assessment," *J. Power Sources* 297, 481-491, DOI: 10.1016/j.jpowsour.2015.07.058 (2015).

59. S. Wahl, A. Gallet Segarra, P. Horstmann, M. Carré, W. G. Bessler, F. Lopicque, and K. A. Friedrich, "Modeling of a thermally integrated 10 kWe planar SOFC System with anode offgas recycling and internal reforming by discretisation in flow direction," *J. Power Sources* 279, 656-666, DOI: 10.1016/j.jpowsour.2014.12.084 (2015).

58. C. Bao and W. G. Bessler, "Two-dimensional modeling of a polymer electrolyte membrane fuel cell with long flow channel. Part II. Physics-based electrochemical impedance analysis," *J. Power Sources*, 278, 675-682, DOI: 10.1016/j.jpowsour.2014.12.045 (2015).

57. C. Bao and W. G. Bessler, "Two-dimensional modeling of a polymer electrolyte membrane fuel cell with long flow channel. Part I. Model development", *J. Power Sources* 275, 922-934, DOI: 10.1016/j.jpowsour.2014.11.058 (2015).

2014

56. N. Tanaka and W. G. Bessler, "Numerical investigation of kinetic mechanism for runaway thermo-electrochemistry in lithium-ion cells," *Solid State Ionics* 262, 70-73 (2014).

55. T. Danner, B. Horstmann, D. Wittmaier, N. Wagner, and W. G. Bessler, "Reaction and transport in Ag/Ag₂O gas diffusion electrodes of aqueous Li-O₂ batteries: Experiments and modeling," *J. Power Sources* 264, 320-332 (2014).

54. A. F. Hofmann, D. N. Fronczek, and W. G. Bessler, "Mechanistic modeling of capacity loss and polysulfide shuttle in lithium-sulfur batteries", *J. Power Sources* 259, 300-310 (2014).

53. V. Yurkiv, R. Costa, Z. Ilhan, A. Ansar, and W. G. Bessler, "Impedance of the surface double layer of LSCF/CGO composite cathodes: An elementary kinetic model", *J. Electrochem. Soc.* 161, F480-F492 (2014).

52. P. Hartmann, D. Grübl, H. Sommer, J. Janek, W. G. Bessler, and P. Adelhelm, "Pressure dynamics in metal-oxygen (metal-air) batteries: a case study on sodium superoxide (NaO₂) cells," *J. Phys. Chem. C* 118, 1461-1471 (2014).

51. S. Tippmann, D. Walper, L. Balboa, B. Spier, and W. G. Bessler, "Low-temperature charging of lithium-ion cells part I: Electrochemical modeling and experimental investigation of degradation behavior," *J. Power Sources*

252, 305-316 (2014).

2013

50. B. Horstmann, B. Gallant, R. Mitchell, W. G. Bessler, Y. Shao-Horn, and M. Z. Bazant, "Rate-dependent morphology of Li₂O₂ growth in Li-O₂ batteries," *J. Phys. Chem. Lett.* 4, 4217-4222 (2013).
49. M. Henke, C. Willich, C. Westner, F. Leucht, J. Kallo, W. G. Bessler, and K. A. Friedrich, "A validated multi-scale model of a SOFC stack at elevated pressure," *Fuel Cells* 13, 773-780 (2013).
48. D. N. Fronczek and W. G. Bessler, "Insight into lithium-sulfur batteries: Elementary kinetic modeling and impedance simulation," *J. Power Sources* 244, 183-188 (2013).
47. B. Horstmann, T. Danner, and W. G. Bessler, "Precipitation in aqueous lithium-oxygen batteries: A model-based analysis," *Energy Environ. Sci.* 6, 1299-1314 (2013).
46. G. Schiller, C. Auer, W. G. Bessler, C. Christenn, Z. Ilhan, P. Szabo, H. Ax, B. Kapadia, W. Meier, "A novel concept for the investigation of gas composition during operation of a solid oxide fuel cell through one-dimensional gas-phase laser Raman spectroscopy," *Appl. Phys. B* 111, 29-38 (2013).
45. T. Ou, F. Delloro, W. G. Bessler, A. Thorel, and C. Nicolella, "Proof of concept for the Dual Membrane Cell. Part II: Mathematical modeling of charge transport and reaction in the dual membrane," *J. Electrochem. Soc.* 160, F367-F374 (2013).

2012

44. J. P. Neidhardt, D. N. Fronczek, T. Jahnke, T. Danner, B. Horstmann, and W. G. Bessler, "A flexible framework for modeling multiple solid, liquid and gaseous phases in batteries and fuel cells," *J. Electrochem. Soc.* 159, A1528-A1542 (2012).
43. V. Yurkiv, A. Gorski, W. G. Bessler, H.-R. Volpp, "Density functional theory study of heterogeneous CO oxidation over an oxygen-enriched yttria-stabilized zirconia surface," *Chem. Phys. Lett.* 543, 213-217 (2012).
42. C. Bao and W. G. Bessler, "A computationally efficient steady-state electrode-level and 1D+1D cell-level fuel cell model," *J. Power Sources* 210, 67-80 (2012).
41. V. Yurkiv, A. Utz, A. Weber, E. Ivers-Tiffée, H.-R. Volpp, and W. G. Bessler, "Elementary kinetic modeling and experimental validation of electrochemical CO oxidation on Ni/YSZ pattern anodes," *Electrochim. Acta* 59, 573-580 (2012).
40. A. Bertei, A. S. Thorel, W. G. Bessler, and C. Nicolella, "Mathematical modeling of mass and charge transport and reaction in a solid oxide fuel cell with mixed ionic conduction," *Chem. Eng. Sci.* 68, 606-616 (2012).

2011

39. M. Henke, J. Kallo, K. A. Friedrich, and W. G. Bessler, "Influence of Pressurization on SOFC Performance and Durability: A Theoretical Study," *Fuel Cells* 11, 581-591 (2011).
38. E. Mutoro, C. Hellwig, B. Luerßen, S. Günther, W. G. Bessler, and J. Janek, "Electrochemically induced oxygen spillover and diffusion on Pt(111): PEEM imaging and kinetic modelling," *Phys. Chem. Chem. Phys.* 13, 12798-12807 (2011).
37. S. Seidler, M. Henke, J. Kallo, W. G. Bessler, U. Maier, and K. A. Friedrich, "Pressurized Solid Oxide Fuel Cells: Experimental Studies and Modeling," *J. Power Sources* 196, 7195-7202 (2011).
36. M. Eschenbach, R. Coulon, A. A. Franco, J. Kallo, and W. G. Bessler, "Multi-scale modelling of fuel cells: From the cell to the system," *Solid State Ionics* 192, 615-618 (2011).

35. W. G. Bessler and T. Nilges, "Trendberichte Festkörperchemie 2010", Nachrichten aus der Chemie 59, 246-253 (2011).
34. F. Leucht, W. G. Bessler, J. Kallo, K. A. Friedrich, and H. Müller-Steinhagen, "Fuel Cell System Modelling for SOFC/GT Hybrid Power Plants, Part I: Modelling and simulation framework," J. Power Sources 196, 1205-1215 (2011).
33. V. Yurkiv, D. Starukhin, H.-R. Volpp, and W. G. Bessler, "Elementary reaction kinetics of the CO/CO₂/Ni/YSZ electrode," J. Electrochem. Soc. 158, B5-B10 (2011).

2010

32. W. G. Bessler, M. Vogler, H. Störmer, D. Gerthsen, A. Utz, A. Weber, and E. Ivers-Tiffée, "Model anodes and anode models for understanding the mechanism of hydrogen oxidation in solid oxide fuel cells," Phys. Chem. Chem. Phys. 12, 13888-13903 (2010).
31. M. Vogler, M. Horiuchi, and W. G. Bessler, "Modeling, simulation and optimization of a no-chamber solid oxide fuel cell operated with a flat-flame burner," J. Power Sources 195, 7067-7077 (2010).
30. W. G. Bessler, S. Gewies, C. Willich, G. Schiller, and K. A. Friedrich, "Spatial distribution of electrochemical performance in a segmented SOFC: A combined modeling and experimental study," Fuel Cells 10, 411-418 (2010).

2009

29. M. Vogler, A. Bieberle-Hütter, L. J. Gauckler, J. Warnatz, and W. G. Bessler, "Modelling study of surface reactions, diffusion, and spillover at a Ni/YSZ patterned anode," J. Electrochem. Soc. 156, B663-B672 (2009).
28. M. Horiuchi, F. Katagiri, J. Yoshiike, S. Suganuma, Y. Tokutake, H. Kronemayer, and W. G. Bessler, "Performance of a solid oxide fuel cell couple operated via in situ catalytic partial oxidation of n-butane," J. Power Sources 189, 950-957 (2009).

2008

27. S. Gewies and W. G. Bessler, "Physically based impedance modeling of Ni/YSZ cermet anodes," J. Electrochem. Soc. 155, B937-B952 (2008).
26. J. Rossmeisl and W. G. Bessler, "Trends in catalytic activity for SOFC anode materials," Solid State Ionics 178, 1694-1700 (2008).
25. T. Lee, W. G. Bessler, J. Yoo, C. Schulz, J. B. Jeffries, and R. K. Hanson, "Fluorescence quantum yield of carbon dioxide for quantitative UV laser-induced fluorescence in high-pressure flames," Appl. Phys. B 93, 677-685 (2008).

2007

24. W. G. Bessler, S. Gewies, and M. Vogler, "A new framework for detailed electrochemical modeling of solid oxide fuel cells," Electrochim. Acta 53, 1782-1800 (2007).
23. W. G. Bessler, "Rapid impedance modeling via potential step and current relaxation simulations," J. Electrochem. Soc. 154, B1186-B1191 (2007).
22. W. G. Bessler and S. Gewies, "Gas concentration impedance of solid oxide fuel cell anodes. II. Channel geometry," J. Electrochem. Soc. 154, B548-B559 (2007).
21. H. Kronemayer, D. Barzan, M. Horiuchi, S. Suganuma, Y. Tokutake, C. Schulz, and W. G. Bessler, "A direct-flame solid oxide fuel cell (DFFC) operated on methane, propane and butane," J. Power Sources 166, 120-126

(2007).

20. W. G. Bessler, J. Warnatz, and D. G. Goodwin, "The influence of equilibrium potential on hydrogen oxidation kinetics of SOFC anodes," *Solid State Ionics* 177, 3371-3383 (2007).

2006

19. M. Tutuianu, O. Inderwildi, W. G. Bessler, and J. Warnatz, "Competitive adsorption of NO, NO₂, CO₂ and H₂O on BaO(100): A quantum chemical study," *J. Phys. Chem. B* 110, 17484-17492 (2006).

18. W. G. Bessler, "Gas concentration impedance of solid oxide fuel cell anodes. I. Stagnation point flow geometry," *J. Electrochem. Soc.* 153, A1492-A1504 (2006).

2005

17. W. G. Bessler, "A new computational approach for SOFC impedance based on detailed electrochemical reaction-diffusion models," *Solid State Ionics* 176, 997-1011 (2005).

16. J. W. Daily, W. G. Bessler, C. Schulz, V. Sick, and T. Settersten, "Nonstationary collisional dynamics in determining nitric oxide laser-induced fluorescence spectra," *AIAA J.* 43, 458-464 (2005).

15. H. Kronemayer, W. G. Bessler, and C. Schulz "Gas-phase temperature imaging in spray systems using multi-line NO-LIF thermometry," *Appl. Phys. B81*, 1071-1074 (2005).

14. T. Lee, W. G. Bessler, H. Kronemayer, C. Schulz, and J. B. Jeffries, "Quantitative temperature measurements in high-pressure flames with multi-line NO-LIF thermometry," *Appl. Opt.* 44, 6718-6728 (2005).

13. A. Franke, W. Koban, J. Olofsson, C. Schulz, W. G. Bessler, R. Reinmann, A. Larsson, and M. Aldén, "Application of advanced laser diagnostics for the investigation of the ionization sensor signal in a combustion bomb," *Appl. Phys. B81*, 1135-1142 (2005).

12. W. G. Bessler, M. Hofmann, F. Zimmermann, G. Suck, J. Jakobs, S. Nicklitzsch, T. Lee, J. Wolfrum, and C. Schulz "Quantitative in-cylinder NO-LIF imaging in a realistic gasoline engine with spray-guided direct injection," *Proc. Combust. Inst.* 30, 2667-2674 (2005).

11. J. B. Jeffries, C. Schulz, D. W. Mattison, M. A. Oehlschlaeger, W. G. Bessler, T. Lee, D. F. Davidson, and R. K. Hanson, "UV Absorption of CO₂ for temperature diagnostics of hydrocarbon combustion applications," *Proc. Combust. Inst.* 30, 1591-1599 (2005).

2004

10. W. G. Bessler and C. Schulz "Quantitative multi-line NO-LIF temperature imaging," *Appl. Phys. B78*, 519-533 (2004).

9. T. Lee, W. G. Bessler, C. Schulz, M. Patel, J. B. Jeffries, and R. K. Hanson, "UV planar laser induced fluorescence imaging of hot carbon dioxide in a high-pressure flame," *Appl. Phys. B79*, 427-430 (2004).

2003

8. M. Hofmann, W. G. Bessler, C. Schulz, and H. Jander, "Laser-induced incandescence (LII) for soot diagnostics at high pressure," *Appl. Opt.*, 2052-2062 (2003).

7. W. G. Bessler, C. Schulz, T. Lee, J. B. Jeffries, and R. K. Hanson, "Carbon dioxide UV laser-induced fluorescence in high-pressure flames," *Chem. Phys. Lett.* 375, 344-349 (2003).

6. W. G. Bessler, C. Schulz, T. Lee, J. B. Jeffries, and R. K. Hanson, "Strategies for laser-induced fluorescence detection of nitric oxide in high-pressure flames. II. A-X(0,1) excitation," *Appl. Opt.* 42, 2031-2042 (2003).

5. W. G. Bessler, C. Schulz, T. Lee, J. B. Jeffries, and R. K. Hanson, "Strategies for laser-induced fluorescence detection of nitric oxide in high-pressure flames: III. Comparison of A-X Strategies," *Appl. Opt.* 42, 4922-4936 (2003).

2002

4. W. G. Bessler, C. Schulz, T. Lee, D. I. Shin, M. Hofmann, J. B. Jeffries, J. Wolfrum, and R. K. Hanson, "Quantitative NO-LIF imaging in high-pressure flames," *Appl. Phys. B* 75, 97-102 (2002).

3. W. G. Bessler, C. Schulz, T. Lee, J. B. Jeffries, and R. K. Hanson, "Strategies for laser-induced fluorescence detection of nitric oxide in high-pressure flames. I. A-X(0,0) excitation," *Appl. Opt.* 41, 3547-3557 (2002).

2. J. B. Bell, M. S. Day, J. F. Grcar, W. G. Bessler, C. Schulz, P. Glarborg, and A. D. Jensen, "Detailed modeling and laser-induced fluorescence imaging of nitric oxide in a NH₃-seeded non-premixed methane/air flame," *Proc. Combust. Inst.* 29, 2195-2202 (2002).

2001

1. W. G. Bessler, F. Hildenbrand, and C. Schulz, "Two-line laser-induced fluorescence imaging of vibrational temperatures of seeded NO," *Appl. Opt.* 40, 748-756 (2001).