

Curriculum Vitae

Dr. Lars Röntzsch

Phone: +49 (172) 2715859
E-mail: Lars@roentzsch.org
Internet: www.roentzsch.org
ORCID-ID: 0000-0002-0997-769X
ResearcherID: P-6234-2014



Employment History

01/2013 to date Head of department »Hydrogen Technology« at the Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM
09/2007 – 12/2012 Group manager at Fraunhofer IFAM
05/2007 – 08/2007 Research staff at Dresden University of Technology, Institute of Materials Science
11/2003 – 04/2007 Research staff at Research Center Dresden-Rossendorf, Institute for Ion Beam Physics and Materials Research

Education

12/2007 Graduation: *Doctor rerum naturalium* (grade: summa cum laude)
09/2003 Graduation: *Diplom-Physiker* (grade: very good)
09/2000 – 05/2001 Study of Physics, Philosophy & Int. Relations at Boston University, MA, USA
10/1997 – 09/2003 Study of Physics at Dresden University of Technology
06/1996 *Abitur* (grade: 1.0)
09/1984 – 06/1996 School attendance

Awards

IQ Innovationspreis Mitteldeutschland (category *Energy·Environment·Solar*), Naumburg, Germany, 2015.
f-cell Award (category *Science*), Stuttgart, Germany, 2013.
E.ON International Research Initiative Award, 2010.
Fraunhofer Attract Grant, 2007.
E-MRS Young Scientist Award, Strasbourg, France, 2004.
IBMM 2004 Poster Award, Monterey, USA, 2004.
Scholarship of the *Kulturstiftung Dresden der Dresdner Bank*, 2000 – 2001.

Skills and Expertise

Computer C/C++, Kinetic Monte Carlo, Basic, Latex, PovRay, RasMol, TRIM, TRIDYN, FlexPDE, COMSOL Multiphysics, Maple, Adobe CS, Corel Draw, Origin, MS Office
Experimental energy storage, hydrogen and fuel cells, electrochemistry, thin-film deposition, thermoanalysis, rapid solidification, metallurgy, metal powder technology, sintering, ion beam technology, electron microscopy, diffraction and scattering, X-ray and neutron imaging
Languages German (native speaker), English (fluent), Spanish (basic), Russian (school level), Latin (school level), Ancient Greek (school level)
Hobbies tennis, ancient Egypt, architecture, glazing techniques, fruit breeding

Publications

- [55] F. Heubner, A. Hilger, N. Kardjilov, I. Manke, B. Kieback, Ł. Gondek, J. Banhart, L. Röntzsch, *In Operando Stress Measurement and Neutron Imaging of Metal Hydride Composites for Solid-State Hydrogen Storage*, Journal of Power Sources, vol. 397, pp. 262–270 (2018).
- [54] A. Gabler, C. I. Müller, T. Rauscher, T. Gimpel, R. Hahn, M. Köhring, B. Kieback, L. Röntzsch, W. Schade, *Ultrashort-pulse laser structured titanium surfaces with sputter-coated platinum catalyst as hydrogen evolution electrodes for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 43, pp. 7216–7226 (2018).
- [53] T. Rauscher, C. I. Müller, A. Gabler, T. Gimpel, M. Köhring, B. Kieback, W. Schade, L. Röntzsch, *Femtosecond-laser structuring of Ni electrodes for highly active hydrogen evolution*, Electrochimica Acta, vol. 247, pp. 1130–1139 (2017).
- [52] A. Gabler, C. I. Müller, T. Rauscher, M. Köhring, B. Kieback, L. Röntzsch, W. Schade, *Ultrashort pulse laser-structured nickel surfaces as hydrogen evolution electrodes for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 42, pp. 10826–10833 (2017).
- [51] F. Heubner, S. Mauermann, B. Kieback, L. Röntzsch, *Stress development of metal hydride composites for high density hydrogen storage applications*, Journal of Alloys and Compounds, vol. 705, pp. 176–182 (2017).
- [50] M. Tegel, S. Schöne, B. Kieback, L. Röntzsch, *An efficient hydrolysis of MgH₂-based materials*, International Journal of Hydrogen Energy, vol. 42, pp. 2167–2176 (2017).
- [49] I. Bürger, M. Dieterich, C. Pohlmann, L. Röntzsch, M. Linder, *Standardized hydrogen storage module with high utilization factor based on metal hydride-graphite composites*, Journal of Power Sources, vol. 342, pp. 970–979 (2017).
- [48] C. Cremers, L. Röntzsch, *Brennstoffzellen als Range-Extender*, pp. 85–89, in R. Neugebauer (Ed.): *Ressourceneffizienz*, Springer Vieweg, Berlin, 2017, ISBN 9783662528884.
- [47] A. Goldberg, C. Pohlmann, L. Röntzsch, C. Freitag, A. T. Tagne Saha, S. Ziesche, U. Partsch, *Highly Efficient and Long-Term Stable Micro Fuel Cell System Based on Ceramic Multilayer Technology*, 6th Electronic System-Integration Technology Conference (ESTC), Grenoble, France, pp. 1–6 (2016). DOI: 10.1109/ESTC.2016.7764494, available online: <http://ieeexplore.ieee.org/document/7764494>
- [46] M. Tegel, L. Röntzsch, *PowerPaste für mobile und autarke Brennstoffzellen*, HZwei, vol. 16 (4), pp. 35–37 (2016).
- [45] T. Rauscher, C. I. Müller, A. Schmidt, B. Kieback, L. Röntzsch, *Ni-Mo-B alloys as cathode material for alkaline water electrolysis*, International Journal of Hydrogen Energy, vol. 41, pp. 2165–2176 (2016).
- [44] C. I. Müller, K. Sellschopp, M. Tegel, T. Rauscher, B. Kieback, L. Röntzsch, *The activity of amorphous iron-based alloys as electrode materials for the hydrogen evolution reaction*, Journal of Power Sources, vol. 304, pp. 196–206 (2016).
- [43] M. Dieterich, C. Pohlmann, I. Bürger, M. Linder, L. Röntzsch, *Long-term cycle stability of metal hydride-graphite composites*, International Journal of Hydrogen Energy, vol. 46, pp.16375–16392 (2015).
- [42] F. Heubner, C. Pohlmann, S. Mauermann, B. Kieback, L. Röntzsch, *Mechanical stresses originating from metal hydride composites during cyclic hydrogenation*, International Journal of Hydrogen Energy, vol. 40, pp. 10123–10130 (2015).
- [41] K. Herbrig, C. Pohlmann, Ł. Gondek, H. Figiel, N. Kardjilov, A. Hilger, I. Manke, J. Banhart, B. Kieback, L. Röntzsch, *Investigations of the Structural Stability of Metal Hydride Composites by In-situ Neutron Imaging*, Journal of Power Sources, vol. 293, pp. 109–118 (2015).
- [40] C. Pohlmann, K. Herbrig, Ł. Gondek, N. Kardjilov, A. Hilger, H. Figiel, J. Banhart, B. Kieback, I. Manke, L. Röntzsch, *In Operando Visualization of Hydride-Graphite Composites during Cyclic Hydrogenation by High-Resolution Neutron Imaging*, Journal of Power Sources, vol. 277, pp. 360–369 (2015).
- [39] J. Fu, M. Tegel, B. Kieback, L. Röntzsch, *Dehydrogenation properties of doped LiAlH₄ compacts for hydrogen generator applications*, International Journal of Hydrogen Energy, vol. 39, pp. 16362–16371 (2014).

- [38] J. Gluch, S. Niese, L. Röntzsch, E. Zschech, *X-ray Microscopy and Tomography of Hydrogen Storage Materials*, *Microscopy and Microanalysis*, vol. 20, suppl. 3, pp. 1568–1569 (2014).
- [37] C. I. Müller, T. Rauscher, A. Schmidt, T. Schubert, T. Weißgärber, B. Kieback, L. Röntzsch, *Electrochemical investigations on amorphous Fe-base alloys for alkaline water electrolysis*, *International Journal of Hydrogen Energy*, vol. 39, pp. 8926–8937 (2014).
- [36] C. Pohlmann, B. Kieback, L. Röntzsch, *Composite materials of melt-spun Mg₉₀Ni₁₀ and graphite: Microstructural changes during cyclic hydrogenation and the impact on gas and heat transport characteristics*, *International Journal of Hydrogen Energy*, vol. 39, pp. 8331–8339 (2014).
- [35] J. Gluch, S. Niese, C. Jung, L. Röntzsch, E. Zschech, B. Kieback, *Electron and X-ray Tomography of Iron/Iron Oxide Redox Reactions for Large-Scale Hydrogen Storage*, *Microscopy and Microanalysis*, vol. 19, suppl. 2, pp. 578–579 (2013).
- [34] K. Herbrig, L. Röntzsch, C. Pohlmann, T. Weißgärber, B. Kieback, *Hydrogen Storage Systems based on Hydride-Graphite Composites: Computer Simulation and Experimental Validation*, *International Journal of Hydrogen Energy*, vol. 38, pp. 7026–7036 (2013).
- [33] C. Pohlmann, T. Hutsch, L. Röntzsch, T. Weißgärber, B. Kieback, *Novel approach for thermal diffusivity measurements in inert atmosphere using the flash-method*, *Journal of Thermal Analysis and Calorimetry*, vol. 114, pp. 629–634 (2013).
- [32] C. Pohlmann, L. Röntzsch, F. Heubner, T. Weißgärber, B. Kieback, *Solid-state hydrogen storage in Hydralloy-graphite composites*, *Journal of Power Sources*, vol. 231, pp. 97–105 (2013).
- [31] C. Pohlmann, L. Röntzsch, T. Weißgärber, B. Kieback, *Heat and gas transport properties in pelletized hydride-graphite composites for hydrogen storage applications*, *International Journal of Hydrogen Energy*, vol. 38, pp. 1685–1691 (2013).
- [30] A. Schmidt, T. Schubert, L. Röntzsch, T. Weißgärber, B. Kieback, *Rapidly solidified Fe-base alloys as electrode materials for water electrolysis*, *International Journal of Materials Research*, vol. 103, pp. 1155–1158 (2012).
- [29] J. Fu, L. Röntzsch, T. Schmidt, M. Tegel, T. Weißgärber, B. Kieback, *Comparative study on the dehydrogenation properties of TiCl₄-doped LiAlH₄ using different doping techniques*, *International Journal of Hydrogen Energy*, vol. 37, pp. 13387–13392, (2012).
- [28] M. E. Toimil-Molares, L. Röntzsch, W. Sigle, K. H. Heinig, C. Trautmann, R. Neumann, *Pipetting Nanowires: In Situ Visualization of Solid-State Nanowire-to-Nanoparticle Transformation Driven by Surface Diffusion-Mediated Capillarity*, *Advanced Functional Materials*, vol. 22, pp. 695–701 (2012).
- [27] J. Fu, L. Röntzsch, T. Schmidt, T. Weißgärber, B. Kieback, *Improved dehydrogenation properties of lithium alanate (LiAlH₄) doped by low energy grinding*, *Journal of Alloys and Compounds*, vol. 525, pp. 73–77 (2012).
- [26] E. D. Kouloukakis, S.S. Makridis, L. Röntzsch, E. Pavlidou, A. Ioannidou, E. S. Kikkinides, A. K. Stubos, *Structural, Microchemistry, and Hydrogenation Properties of TiMn_{0.4}Fe_{0.2}V_{0.4}, TiMn_{0.1}Fe_{0.2}V_{0.7} and Ti_{0.4}Zr_{0.6}Mn_{0.4}Fe_{0.2}V_{0.4} Metal Hydrides*, *Journal of Nanoscience and Nanotechnology*, vol. 12, pp. 4688–4696 (2012).
- [25] C. Pohlmann, L. Röntzsch, J. J. Hu, T. Weißgärber, B. Kieback, M. Fichtner, *Tailored heat transfer characteristics of pelletized LiNH₂-MgH₂ and NaAlH₄ hydrogen storage materials*, *Journal of Power Sources*, vol. 205, pp. 173–179 (2012).
- [24] T. Schmidt, L. Röntzsch, T. Weißgärber, B. Kieback, *Influence of transition metal dopants and temperature on the dehydrogenation and rehydrogenation kinetics of NaAlH₄*, *International Journal of Hydrogen Energy*, vol. 37, pp. 4194–4200 (2012).
- [23] S. Kalinichenka, L. Röntzsch, T. Riedl, T. Weißgärber, B. Kieback, *Hydrogen storage properties and microstructure of melt-spun Mg₉₀Ni₈RE₂ (RE = Y, Nd, Gd)*, *International Journal of Hydrogen Energy*, vol. 36, pp. 10808–10815 (2011).
- [22] S. Kalinichenka, L. Röntzsch, T. Riedl, T. Gemming, T. Weißgärber, B. Kieback, *Microstructure and hydrogen storage properties of melt-spun Mg-Cu-Ni-Y alloys*, *International Journal of Hydrogen Energy*, vol. 36, pp. 1592–1600 (2011).

- [21] C. Pohlmann, L. Röntzsch, S. Kalinichenka, T. Hutsch, T. Weißgärber, B. Kieback, *Hydrogen storage properties of compacts of melt-spun Mg₉₀Ni₁₀ flakes and expanded natural graphite*, Journal of Alloys and Compounds, vol. 509, pp. S625–S628 (2011).
- [20] S. Kalinichenka, L. Röntzsch, C. Baehtz, T. Weißgärber, B. Kieback, *Hydrogen desorption properties of melt-spun and hydrogenated Mg-based alloys using in situ synchrotron X-ray diffraction and TGA*, Journal of Alloys and Compounds, vol. 509, pp. S629–S632 (2011).
- [19] T. Schmidt, L. Röntzsch, T. Weißgärber, B. Kieback, *Reversible hydrogen storage in Ti–Zr-codoped NaAlH₄ under realistic operation conditions: Part 2*, Journal of Alloys and Compounds, vol. 509, pp. S740–S742 (2011).
- [18] L. Röntzsch, T. Schmidt, S. Kalinichenka, B. Kieback, *Hydrogen Storage in Melt-spun Nanocrystalline Mg-Ni-Y Alloys*, pp. 159–163 in D. Stolten, T. Grube (Eds.): *18th World Hydrogen Energy Conference 2010 - WHEC 2010*, Parallel Sessions Book 4: Storage Systems / Policy Perspectives, Initiatives and Cooperations, Forschungszentrum Jülich, 2010, ISBN 9783893366545.
- [17] C. Pohlmann, L. Röntzsch, S. Kalinichenka, T. Hutsch, B. Kieback, *Magnesium alloy-graphite composites with tailored heat conduction properties for hydrogen storage applications*, International Journal of Hydrogen Energy, vol. 35, pp. 12829–12836 (2010).
- [16] T. Schmidt, L. Röntzsch, *Reversible hydrogen storage in Ti-Zr-codoped NaAlH₄ under realistic operation conditions*, Journal of Alloys and Compounds, vol. 496, pp. L38–L40 (2010).
- [15] S. Kalinichenka, L. Röntzsch, C. Baehtz, B. Kieback, *Hydrogen desorption kinetics of melt-spun and hydrogenated Mg₉₀Ni₁₀ and Mg₈₀Ni₁₀Y₁₀ using in situ synchrotron, X-ray diffraction and thermogravimetry*, Journal of Alloys and Compounds, vol. 496, pp. 608–613 (2010).
- [14] L. Röntzsch, T. Schmidt, S. Kalinichenka, C. Pohlmann, A. Schmidt, T. Weißgärber, B. Kieback, *Wasserstoffspeicherung in nanoskaligen Feststoffen*, pp. 41–56 in H. Kolaska (Ed.): *Energie- und Ressourceneffizienz durch Pulvermetallurgie*, Proceedings of the 28th Hagener Symposium, Heimdall-Verlag, Witten, 2009, ISBN 978939935391.
- [13] L. Röntzsch, S. Kalinichenka, B. Kieback, *Microstructure and De-/Hydrogenation Behavior of Melt-Spun Mg-Ni-Y Alloys as Hydrogen Storage Materials*, pp. 1085–1090 in K.U. Kainer (Ed.): *Magnesium. Proceedings of the 8th International Conference on Magnesium Alloys and their Applications*, Wiley-VCH, Weinheim, 2009, ISBN 9783527327324.
- [12] T. Schmidt, L. Röntzsch, S. Kalinichenka, J. Meinert, B. Kieback, *Entwicklung reversibler Wasserstoffspeichersysteme auf Basis nanostrukturierter Metallhydride*, Chemie Ingenieur Technik, vol. 81, p. 1136 (2009).
- [11] S. Kalinichenka, L. Röntzsch, B. Kieback, *Structural and hydrogen storage properties of melt-spun Mg–Ni–Y alloys*, International Journal of Hydrogen Energy, vol. 34, pp. 7749–7755 (2009).
- [10] L. Röntzsch, *Shape evolution of nanostructures by thermal and ion beam processing*, Wissenschaftlich-technische Berichte des Forschungszentrums Dresden-Rossendorf, FZR-488, 2008, 177 pages.
- [9] L. Röntzsch, K.-H. Heinig, J. A. Schuller, M. L. Brongersma, *Thin film patterning by surface-plasmon-induced thermocapillarity*, Applied Physics Letters, vol. 90, pp. 044105/1–3 (2007).
- [8] B. Schmidt, K.-H. Heinig, L. Röntzsch, K.-H. Stegemann, *Nanocluster memories by ion beam synthesis of Si in SiO₂*, Materials Science-Poland, vol. 25, pp. 1213–1222 (2007).
- [7] B. Schmidt, A. Mücklich, L. Röntzsch, K.-H. Heinig, *How do high energy heavy ions shape Ge nanoparticles embedded in SiO₂?*, Nuclear Instruments and Methods in Physics Research B, vol. 257, pp. 30–32 (2007).
- [6] L. Röntzsch, K.-H. Heinig, B. Schmidt, A. Mücklich, *Experimental evidence of Si nanocluster δ -layer formation in the vicinity of ion-irradiated SiO₂-Si interfaces*, Nuclear Instruments and Methods in Physics Research B, vol. 242, pp. 149–151 (2006).
- [5] B. Schmidt, K.-H. Heinig, L. Röntzsch, T. Müller, K.-H. Stegemann, E. Votintseva, *Ion irradiation through SiO₂/Si interfaces: Non-conventional fabrication of Si nanocrystals for memory applications*, Nuclear Instruments and Methods in Physics Research B, vol. 242, pp. 146–148 (2006).

- [4] L. Röntzsch, K.-H. Heinig, B. Schmidt, A. Mücklich, W. Möller, J. Thomas, T. Gemming, *Direct evidence of self-aligned Si nanocrystals formed by ion irradiation of Si/SiO₂ interfaces*, *physica status solidi A*, vol. 202, pp. R170–R172 (2005).
- [3] L. Röntzsch, K.-H. Heinig, *Reaction pathways of ion beam synthesis and stability of monocrystalline nanowires*, pp. 165–169 in P. Pödör et al. (Eds.): *Proceedings Int. Workshop on Semicond. Nanocrystals*, Vol. 1, Budapest, Hungary, 2005, ISBN 9637371184.
- [2] L. Röntzsch, K.-H. Heinig, B. Schmidt, *Experimental Evidence of Si Nanocluster δ -Layer Formation in Buried and Thin SiO₂ Films Induced by Ion Irradiation*, *Materials Science in Semiconductor Processing*, vol. 7, pp. 357–362 (2004).
- [1] L. Röntzsch, *Self-Organization of Nanocluster Delta-Layers at Ion-Beam-Mixed Si-SiO₂ Interfaces*, *Wissenschaftlich-technische Berichte des Forschungszentrums Rossendorf, FZR-392*, 2003, 91 pages.

Patents

- [7] L. Röntzsch, B. Kieback, M. Dieterich, I. Bürger, C. Pohlmann; *STORAGE ELEMENT FOR GASES*; DE102015213061 (A1), EP3118511 (A1).
- [6] C. Pohlmann, L. Röntzsch, B. Kieback, F. Heubner; *METHOD AND MEASURING DEVICE FOR DETERMINING THE AMOUNT OF A GAS CONTAINED IN A STORAGE DEVICE ON A POROUS STORAGE MATERIAL*; DE102015100584 (B3), EP3045910 (A1).
- [5] M. Tegel, L. Röntzsch, B. Kieback; *COMPOSITE MATERIAL FOR HYDROLYTICALLY GENERATING HYDROGEN, DEVICE FOR HYDROLYTICALLY GENERATING HYDROGEN, METHOD FOR GENERATING HYDROGEN, DEVICE FOR GENERATING ELECTRIC ENERGY, AND POSSIBLE APPLICATIONS*; DE102014211422 (A1), WO2015189247 (A1).
- [4] M. Tegel, L. Röntzsch, B. Kieback; *DEVICE AND METHOD FOR THE HYDROLYTIC PRODUCTION OF HYDROGEN, DEVICE FOR PRODUCING ELECTRICAL ENERGY AND POSSIBILITIES FOR USAGE*; DE102013211106 (A1), EP3008012 (A1), WO2014198948 (A1).
- [3] M. Tegel, L. Röntzsch, T. Weißgärber, B. Kieback; *METHOD FOR RECLAIMING NEODYMIUM OXIDE FROM A STARTING MIXTURE*; DE102012017418 (B4), WO2014033004 (A1).
- [2] L. Röntzsch, T. Schmidt; *RELEASING HYDROGEN FROM METAL HYDRIDE, COMPRISES HYDROLYZING BY ADDING WATER, AND ADDITIONALLY ADDING ACIDIC ADDITIVE, WHICH EXHIBITS BUFFERING EFFECT FOR METAL HYDRIDE, AND IS DISSOLVED IN WATER OR IS PRESENT IN SOLID OR SUSPENDED FORM*; DE102011115073 (A1).
- [1] W. Hungerbach, B. Kieback, J. Kunze, L. Röntzsch, G. Stephani; *REVERSIBLE HYDROGEN STORAGE ELEMENT AND METHOD FOR THE FILLING AND EMPTYING THEREOF*; DE102007038779 (B4), WO2009018821 (A2), WO2009018821 (A3).