Publications and invited talks

Online publication lists

- ORCID: www.orcid.org/0000-0002-1252-806X
- ResearcherID: https://www.webofscience.com/wos/author/rid/H-8552-2013
- Google Scholar: https://scholar.google.com/citations?user=-8Y7CC8AAAAJ

H-index (Web of Science/Google Scholar): 17/18.

Peer-reviewed articles

40. T Hannappel, S Shekarabi, W Jaegermann, E Runge, JP Hofmann, R van de Krol, **MM May**, A Paszuk, F Hess, A Bergmann, A Bund, C Cierpka, C Dreßler, F Dionigi, D Friedrich, M Favaro, S Krischok, M Kurniawan, K Lüdge, Y Lei, BR Cuenya, P Schaaf, R Schmidt-Grund, WG Schmidt, P Strasser, E Unger, MV Montoya, D Wang, and H Zhang. "Integration of multi-junction absorbers and catalysts for efficient solar-driven artificial leaf structures: a physical and materials science perspective". *Solar RRL* **8**(11) (2024), p. 2301047. DOI: 10.1002/solr.202301047.
39. J Leist, J Kim, H Euchner, and **MM May**. "The relevance of structural variability in the time-domain for computational reflection anisotropy spectroscopy at solid-liquid interfaces". *Journal of Physics: Condensed Matter* **36**(18) (2024), p. 185002. DOI: 10.1088/1361-648X/ad215b.
38. D Lörch, AGA Mohamed, H Euchner, J Timm, J Hiller, P Bogdanoff, and **MM May**. "From CO_2 to Solid Carbon: Reaction Mechanism, Active Species, and Conditioning the Ce-Alloyed GaInSn Catalyst". *Journal of Physical Chemistry C* **in print** (2024). DOI: 10.1021/acs.jpcc.4c05482.
37. M Löw, J Grill, **MM May**, and J Popovic-Neuber. "Magnesium and Aluminum in Contact with Liquid Battery Electrolytes: Ion Transport through Interphases and in the Bulk". *ACS Materials Letters* **6** (2024), pp. 5120–5127. DOI: 10.1021/acsmaterialslett.4c01589.
36. M Löw and **MM May**. "Operando Investigation of Al Plating Regimes on HOPG in [EMImCl]:$AlCl_3$ by Electrochemical Reflection Anisotropy Spectroscopy". *Batteries & Supercaps* **in print** (2024), e202400610. DOI: 10.1002/batt.202400610.
35. M Guidat, M Löw, M Kölbach, J Kim, and **MM May**. "Experimental and Computational Aspects of Electrochemical Reflection Anisotropy Spectroscopy". *ChemElectroChem* **10**(8) (2023), e202300027. DOI: 10.1002/celc.202300027.
34. M Guidat, F Rahide, M Löw, J Kim, H Ehrenberg, S Dsoke, and **MM May**. "In Situ Monitoring of the Al(110)-[EMImCl]:AlCl3 Interface by Reflection Anisotropy Spectroscopy". *Batteries & Supercaps* **7** (2023). DOI: 10.1002/batt.202300394.
33. EA Schmitt, M Guidat, M Nusshör, AL Renz, K Möller, M Flieg, D Lörch, M Kölbach, and **MM May**. "Photoelectrochemical Schlenk cell funcionalization of multi-junction water-splitting photoelectrodes". *Cell Reports Physical Science* **4**(10) (2023), p. 101606. DOI: 10.1016/j.xcrp.2023.101606.
32. J Kim and **MM May**. "Resta-like preconditioning for self-consistent field iterations in the linearized augmented planewave method". *Electronic Structure* **4**(4) (2022), p. 047003. DOI: 10.1088/2516-1075/aca24a.
31. M Kölbach, O Höhn, K Rehfeld, M Finkbeiner, J Barry, and **MM May**. "The annual-hydrogen-yield-climatic-response ratio: evaluating the real-life performance of integrated solar water splitting devices". *Sustainable Energy Fuels* **6** (2022), pp. 4062–4074. DOI: 10.1039/D2SE00561A.
30. M Löw, M Guidat, J Kim, and **MM May**. "The Interfacial Structure of InP(100) in Contact with HCl and H_2SO_4 studied by Reflection Anisotropy Spectroscopy". *RSC Advances* **12**(50) (2022), pp. 32756–32764. DOI: 10.1039/d2ra05159a.
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24. A Paszuk, O Supplie, S Brückner, E Barrigón, **MM May**, M Nandy, A Gieß, A Dobrich, P Kleinschmidt, I Rey-Stolle, and T Hannappel. "Atomic surface control of Ge(100) in MOCVD reactors coated with (Ga)As residuals". *Applied Surface Science* (2021), p. 150513. DOI: 10.1016/j.apsusc.2021.150513.
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20. M Mohamed, **MM May**, M Kanis, M Brützam, R Uecker, R van de Krol, C Janowitz, and M Mulazzi. "The electronic structure and the formation of polarons in Mo-doped $BiVO_4$ measured by angle-resolved photoemission spectroscopy". *RSC Advances* **9** (2019), pp. 15606–15614. DOI: 10.1039/C9RA01092K.
19. WH Cheng, MH Richter, **MM May**, J Ohlmann, D Lackner, F Dimroth, T Hannappel, HA Atwater, and HJ Lewerenz. "Monolithic Photoelectrochemical Device for 19% Direct Water Splitting". *ACS Energy Letters* **3**(8) (2018), pp. 1795–1800. DOI: 10.1021/acsenergylett.8b00920.
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13. O Supplie, **MM May**, C Höhn, H Stange, A Müller, P Kleinschmidt, S Brückner, and T Hannappel. "Formation of GaP/Si(100) heterointerfaces in presence of inherent reactor residuals". *ACS Applied Materials & Interfaces* **7**(18) (2015), pp. 9323–9327. DOI: 10.1021/acsami.5b02231.

12. O Supplie, **MM May**, P Kleinschmidt, A Nägelein, A Paszuk, S Brückner, and T Hannappel. "In situ controlled heteroepitaxy of single-domain GaP on As-modified Si(100)". *APL Materials* **3**(12), 126110 (2015). DOI: 10.1063/1.4939005.
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10. **MM May**, HJ Lewerenz, and T Hannappel. "Optical in situ Study of InP(100) Surface Chemistry: Dissociative Adsorption of Water and Oxygen". *Journal of Physical Chemistry C* **118**(33) (2014), pp. 19032–19041. DOI: 10.1021/jp502955m.
9. A Ramírez, P Hillebrand, D Stellmach, **MM May**, P Bogdanoff, and S Fiechter. "Evaluation of MnO_x, Mn_2O_3, and Mn_3O_4 Electrodeposited Films for the Oxygen Evolution Reaction of Water". *Journal of Physical Chemistry C* **118**(26) (2014), pp. 14073–14081. DOI: 10.1021/jp500939d.
8. P Sippel, O Supplie, **MM May**, R Eichberger, and T Hannappel. "Electronic structures of GaP(100) surface reconstructions probed with two-photon photoemission spectroscopy". *Physical Review B* **89** (2014), p. 165312. DOI: 10.1103/PhysRevB.89.165312.
7. O Supplie, S Brückner, O Romanyuk, H Döscher, C Höhn, **MM May**, P Kleinschmidt, F Grosse, and T Hannappel. "Atomic scale analysis of the GaP/Si(100) heterointerface by in situ reflection anisotropy spectroscopy and ab initio density functional theory". *Physical Review B* **90**(23) (2014), p. 235301. DOI: 10.1103/PhysRevB.90.235301.
6. O Supplie, **MM May**, H Stange, C Höhn, HJ Lewerenz, and T Hannappel. "Materials for light-induced water splitting: In situ controlled surface preparation of GaPN epilayers grown lattice-matched on Si(100)". *Journal of Applied Physics* **115**(11), 113509 (2014), p. 113509. DOI: 10.1063/1.4869121.
5. FF Abdi, TJ Savenije, **MM May**, B Dam, and R van de Krol. "The Origin of Slow Carrier Transport in $BiVO_4$ Thin Film Photoanodes: A Time-Resolved Microwave Conductivity Study". *Journal of Physical Chemistry Letters* **4**(16) (2013), pp. 2752–2757. DOI: 10.1021/jz4013257.
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2. **MM May**, C Brabetz, C Janowitz, and R Manzke. "Charge-Density-Wave Phase of 1T-$TiSe_2$: The Influence of Conduction Band Population". *Physical Review Letters* **107**(17) (2011), p. 176405. DOI: 10.1103/PhysRevLett.107.176405.
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Submitted papers & preprints

2. M Adam, T Kleinen, **MM May**, and K Rehfeld. "Land conversions not climate effects are the dominant consequence of sun-driven CO_2 capture, conversion and sequestration". *EarthArXiv preprint* (2024). DOI: 10.31223/X5N713.
1. AG Mohamed, D Lörch, H Euchner, **MM May**, and P Bogdanoff. "CO_2 reduction on liquid GaInSn-metal: Dynamics of the electrode-electrolyte interface". *submitted* (2024).

Non-peer-reviewed articles and data publications

9. M Kölbach, O Höhn, K Rehfeld, M Finkbeiner, J Barry, and **MM May**. *Data set for "The annual-hydrogen-yield-climatic- response ratio: evaluating the real-life performance of integrated solar water splitting devices"*. Version 1. Zenodo, (2022). DOI: 10.5281/zenodo.7024844.
8. M Löw, M Guidat, J Kim, and **MM May**. *Data set for "The interfacial structure of InP(100) in contact with HCl and H_2SO_4 studied by reflection anisotropy spectroscopy"*. Zenodo, (2022). DOI: 10.5281/zenodo.7410144.
7. **MM May** and M Kölbach. *YaSoFo - Yet Another SOlar Fuels Optimizer*. Version v1.5.1. (2022). DOI: 10.5281/zenodo.7326981.
6. **MM May**. "Effiziente Erzeugung regenerativer Brennstoffe über die solare Wasserspaltung". *Naturwissenschaftliche Rundschau* **72**(1) (2019), pp. 10–15.
5. O Supplie, **MM May**, S Brückner, A Nägelein, P Kleinschmidt, and T Hannappel. "Watching the formation of the GaP/Si(100) heterointerface in situ". In: *IEEE 42nd Photovoltaic Specialist Conference (PVSC)*. (2015). DOI: 10.1109/PVSC.2015.7356381.
4. O Supplie, S Brückner, **MM May**, and T Hannappel. "Scrutinising growth". *Compound Semiconductor* **21**(5) (2015), pp. 57–59.
3. O Supplie, S Brückner, O Romanyuk, **MM May**, H Döscher, P Kleinschmidt, H Stange, A Dobrich, C Höhn, HJ Lewerenz, F Grosse, and T Hannappel. "An experimental-theoretical atomic-scale study - In situ analysis of III-V on Si(100) growth for hybrid solar cells". In: *IEEE 40th Photovoltaic Specialist Conference (PVSC)*. (2014), pp. 2797–2799. DOI: 10.1109/PVSC.2014.6925510.
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1. O Supplie, H Döscher, **MM May**, and T Hannappel. "Heteroepitaxial III-V on Si(100) tandem absorbers structures for photoelectrolysis". *AIP Conference Proceedings* **1568**(1) (2013), pp. 20–23. DOI: 10.1063/1.4848082.

Book chapters

3. A Hajduk, MA Zare Pour, A Paszuk, M Guidat, M Löw, F Ullmann, DC Moritz, JP Hofmann, S Krischok, E Runge, WG Schmidt, W Jaegermann, **MM May**, and T Hannappel. "(Photo-)electrochemical Reactions on semiconductor surfaces, part B: III-V surfaces-atomic and electronic structure". In: *Encyclopedia of Solid-Liquid Interfaces (First Edition)*. Ed. by K Wandelt and G Bussetti. First Edition. Oxford: Elsevier, (2023), pp. 120–156. DOI: 10.1016/B978-0-323-85669-0.00113-6.
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1. T Hannappel, **MM May**, and HJ Lewerenz. "Epitaxial III-V Thin Film Absorbers: Preparation, Efficient InP Photocathodes and Routes to High Efficiency Tandem Structures". In: *Photoelectrochemical Water Splitting: Materials, Processes and Architectures*. Ed. by HJ Lewerenz and L Peter. The Royal Society of Chemistry, (2013). Chap. 9, pp. 223–265. DOI: 10.1039/9781849737739-00223.

Invited talks

12. **MM May**. "Scaling up high efficiencies to larger photoelectrode areas by photoelectrochemical Schlenk cell functionalisation". NanoGe MATSUS24, Barcelona, Spain. (2024).

11. **MM May** and H Euchner. “Electrochemical Reflection Anisotropy Spectroscopy on III-V Photoelectrodes and Al Batteries”. The 14th International Conference on Optics of Surfaces and Interfaces (OSI-14), Mautendorf, Austria. (2024).
10. **MM May**. “Das H2Demo Projekt: Demonstratoren für die direkte solare Wasserstofferzeugung”. Wasserstoff Netzwerktreffen der Industrie- und Handelskammer Reutlingen. (2022).
9. **MM May**. “Shaping semiconductor-electrolyte interfaces for high efficiencies by photoelectrochemical processes”. US-German workshop series on artificial photosynthesis. (2022).
8. **MM May**. “Photoelectrolysis: Highly Integrated Solar-Driven Green Hydrogen Production”. EU Agenda Workshop on Green Hydrogen, Rome, Italy. (2021).
7. K Rehfeld and **MM May**. “Towards Negative Emissions through Photoelectrochemical Methods: The NETPEC Project”. Together with K. Rehfeld. Arctic Circle Assembly, Iceland. (2021).
6. **MM May**. “Artificial photosynthesis: From solar fuels to negative emissions”. Institute of Environmental Physics Colloquium, Heidelberg University, Germany. (2019).
5. **MM May**. “Challenges and Opportunities of Water Splitting with Multi-Junction Solar Absorbers”. nanoGe Fall Meeting, Torremolinos, Spain. (2018).
4. **MM May**. “III–V Semiconductor Surfaces for Photelectrochemical Energy Conversion”. FG Surface Science Seminar, Technical University of Darmstadt, Germany. (2017).
3. **MM May** and HJ Lewerenz. “In-situ Formation of Nano-Dimensioned Interface Layers for Efficient Water Photolysis”. 5th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems, Porto Heli, Greece. (2016).
2. **MM May**. “Artificial Photosynthesis: Efficient Water Splitting with Surface-Functionalised Tandem Absorbers”. Seminar “Regenerative Energien: Grundlagen und Anwendungen", TU Cottbus, Germany. (2015).
1. **MM May**. “III-V Semiconductor Surfaces for Solar Water Splitting”. Adlershofer Forschungsforum, Berlin, Germany. (2014).

Patents

2. **MM May**, T Hannappel, and HJ Lewerenz. “Photoelektrochemische Zelle zur lichtinduzierten Wasserspaltung”. German. DE 10 2016 119 634 A8; WO 2018068953 A1; EP 3526370B1; US 11,293,108 B2. (2021).
1. **MM May**, HJ Lewerenz, and T Hannappel. “Verfahren zum Herstellen einer Photoelektrode zur Wasserstoffentwicklung”. German. DE 10 2014 105 545 B3. (2015).

Tübingen, 21st November, 2024