

Moritz F. Kuehnel

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Current position: Chemistry Lecturer, Swansea University

Education and Academic Career

- since 12/2017 **Lecturer in Chemistry, Swansea University** ([link](#))
- 7/2015 – 11/2017 **Senior Research Associate, University of Cambridge**
 Christian Doppler Laboratory for Sustainable Syngas Chemistry ([link](#))
 Supervisor: Dr. Erwin Reisner
Functional molecule/nanoparticle hybrid materials for solar-driven syngas generation
- 8/2012 – 6/2015 **Postdoctoral Research Associate, University of Cambridge**
 Christian Doppler Laboratory for Sustainable Syngas Chemistry
 Supervisor: Dr. Erwin Reisner
Earth-abundant molecular electrocatalysts for CO₂ reduction
- 2/2012 – 7/2012 **Postdoctoral Researcher, Humboldt-Universität zu Berlin**
 Supervisor: Prof. Thomas Braun ([link](#))
Activation of small molecules by transition metal catalysts
- 2009 – 2012 **Associate Member, Doctoral Training Centre ‘Fluorine as a Key Element’, Berlin** ([link](#))
Interdisciplinary training in fluorine chemistry
- 2007 – 2011 **Doctoral Research Assistant, Freie Universität Berlin**
 Supervisor: Prof. Dieter Lentz ([link](#))
 Dr. rer. nat. ‘*summa cum laude*’ (highest grade, equivalent to PhD)
Metal Hydride-Induced Hydrodefluorination of Fluorinated Alkenes and Allenes ([link to PDF](#))
- 2000 – 2007 **Studies in Chemistry, Freie Universität Berlin**
 Supervisor: Prof. Dieter Lentz
 Chemistry Diplom ‘*very good*’ (highest grade, equivalent to Master’s)
Hydrometalation Reactions of Fluorinated Allenes

Awards and Honours

- Feb 2017 Travel bursary for the 2017 Chemiedozententagung, Fond der Chemischen Industrie (FCI)
- Jan 2017 EES Prize for the ‘*Best Oral Presentation*’ at the 5th UK Solar Fuels Meeting, RSC
- Dec 2016 Travel bursary for attending the 5th UK Solar Fuels Meeting, UKSFN
- Jun 2016 Travel bursary for attending the 6th EuCheMS chemistry conference, RSC
- May 2016 Conference scholarship for the 2nd UK-Japan Solar Fuels Workshop, Sasakawa Foundation
- Jul 2015 Promotion to Senior Research Associate, University of Cambridge
- Apr 2013 Publication of the Month, Department of Chemistry, FU Berlin ([link](#))
- Feb 2013 Postdoctoral Research Fellowship, German Research Foundation (DFG, [link](#))
- Dec 2012 Isaac Newton Trust Fellowship, Trinity College, Cambridge
- Nov 2012 Schering Prize for the ‘*Best Chemistry Dissertation*’, Ernst Schering Foundation ([link](#))
- Jul 2012 Travel grant for attending the 25th ICOMC, German Academic Exchange Service (DAAD)
- Mar 2012 Publication of the Month, Department of Chemistry, FU Berlin ([link](#))
- Sep 2011 ‘*Best Publication in Fluorine Chemistry*’, German Chemical Society ([link](#))
- Jul 2010 Publication of the Month, Department of Chemistry, FU Berlin ([link](#))
- Jul 2010 Travel bursary for attending the 16th ESFC, German Chemical Society (GDCh)
- Jun 2009 Publication of the Month, Department of Chemistry, FU Berlin ([link](#))

Publications**h-Index:** 11**Total citations:** 596[\(Google Scholar\)](#)**Articles**

M. F. Kuehnel, C. D. Sahm, G. Neri, J. R. Lee, K. L. Orchard, A. J. Cowan and E. Reisner, “ZnSe quantum dots modified with a Ni(cyclam) catalyst for efficient visible-light driven CO₂ reduction in water”, *Chem. Sci.*, DOI: 10.1039/C7SC04429A, accepted ([link](#)).

M. F. Kuehnel* and E. Reisner,* “Solar hydrogen generation from lignocellulose”, *Angew. Chem. Int. Ed.*, DOI:10.1002/anie.201710133, accepted ([link](#)).

B. Reuillard, K. H. Ly, T. E. Rosser, M. F. Kuehnel, I. Zebger and E. Reisner, “Tuning Product Selectivity for Aqueous CO₂ Reduction with a Mn(bipyridine)-pyrene Catalyst Immobilized on a Carbon Nanotube Electrode”, *J. Amer. Chem. Soc.*, 2017, **139**, 14425-14435 ([link](#)).

M. F. Kuehnel, K. L. Orchard, K. E. Dalle and E. Reisner, “Selective photocatalytic CO₂ reduction in water through anchoring of a molecular Ni catalyst on CdS nanocrystals”, *J. Amer. Chem. Soc.*, 2017, **139**, 7217-7223 ([link](#)).

D. W. Wakerley,[†] M. F. Kuehnel,[†] K. L. Orchard, K. H. Ly, T. E. Rosser and E. Reisner, “Solar-driven reforming of lignocellulose to H₂ with a CdS/CdO_x photocatalyst”, *Nat. Energy*, 2017, **2**, 17021 ([link](#), [†] shared first authorship). Highlighted in the press ([Reuters TV](#), [Business Weekly](#), [Natural Gas Daily](#), [The Engineer](#) and others)

M. Crespo-Quesada, L. M. Pazos-Outón, J. Warnan, M. F. Kuehnel, R. H. Friend and E. Reisner, “Metal-encapsulated organolead halide perovskite photocathode for solar-driven hydrogen evolution in water”, *Nat. Commun.* 2016, **7**, 12555 ([link](#)).

M. F. Kuehnel, D. W. Wakerley, K. L. Orchard and E. Reisner, “Photocatalytic Formic Acid Conversion on CdS Nanocrystals with Controllable Selectivity for H₂ or CO”, *Angew. Chem. Int. Ed.*, 2015, **54**, 9627–9631. Featured on the inside cover ([link](#)).

M. F. Kuehnel, D. Lentz and T. Braun, “Synthesis of fluorinated building blocks by transition metal-mediated hydrodefluorination reactions”, *Angew. Chem. Int. Ed.* 2013, **52**, 3328–3348 ([link](#)).

M. F. Kuehnel, P. Holstein, M. Kliche, J. Krüger, S. Matthies, D. Nitsch, J. Schutt, M. Sparenberg and D. Lentz, “Titanium-Catalyzed Vinylic and Allylic C-F Bond Activation – Scope, Limitations and Mechanistic Insight”, *Chem. – Eur. J.* 2012, **18**, 10701–10714 ([link](#)).

M. F. Kuehnel, T. Schlöder, S. Riedel, B. Nieto-Ortega, F. J. Ramírez, J. T. López Navarrete, J. Casado and D. Lentz, “Synthesis of the Smallest Axially Chiral Molecule via Asymmetric Carbon-Fluorine Bond Activation”, *Angew. Chem. Int. Ed.* 2012, **51**, 2218–2220 ([link](#)). Highlighted in *Nachrichten aus der Chemie* 2012, **60**, 6.

M. F. Kühnel and D. Lentz, “Fluorinated dienes in transition-metal chemistry – the rich chemistry of electron-poor ligands”, *Dalton Trans.* 2010, **39**, 9745–9759 ([link](#)). Featured on the front cover.

M. F. Kühnel and D. Lentz, “Titanium-Catalyzed C-F Activation of Fluoroalkenes”, *Angew. Chem. Int. Ed.* 2010, **49**, 2933–2936 ([link](#)). Classified as ‘Hot Paper’ and honoured with the AG Fluorchemie Publication Prize 2010/2011.

M. F. Kühnel and D. Lentz, “Hydrometalation of Fluoroallenes”, *Dalton Trans.* 2009, 4747–4755 ([link](#)). Classified as ‘Hot Article’.

T. Hügler, M. F. Kühnel and D. Lentz, “Hydrazine Borane – A Promising Hydrogen Storage Material”, *J. Am. Chem. Soc.* 2009, **131**, 7444–7446 ([link](#)).

Patents

D. W. Wakerley, M. F. Kuehnel, K. L. Orchard, E. Reisner, “Photocatalyst and photocatalytic methods”, appl. GB1619953.1; appl. GB1701130.5; PCT/EP2017/080371.

Book Chapters

M. F. Kuehnel and D. Lentz, “Preparation of Fluoroolefins”, in *Efficient Preparation of Fluorine Compounds*, ed. H. W. Roesky, Wiley, pp. 315–333, 2013 ([link](#)).

Presentations

Invited and Keynote Lectures

- “Quantum dot surface engineering for photocatalytic CO₂ reduction and H₂ evolution”, MRS Spring Meeting, Phoenix, April 2018.
- “An Introduction to Solar Fuels”, Global Student Engineering Conference, London, November 2017.
- “The UK Solar Fuels Network”, Sustainable CO₂ Capture and Utilisation Workshop, Santander, September 2017.
- “Quantum dot surface engineering for Solar Fuels Production”, Freie Universität Berlin, June 2017.
- “Quantum dot surface engineering for photocatalytic syngas generation”, 1st FOTOFUEL Conference and School, Almeria, October 2016 (keynote lecture).
- “Surface engineering of quantum dots for efficient photocatalytic syngas generation”, 6th EuCheMS Chemistry Congress, Seville, September 2016 (keynote lecture).
- “Photocatalytic Formic Acid Decomposition on CdS Nanocrystals with Controllable Selectivity for H₂ or CO”, Christian Doppler Symposium on Solar Fuels, Cambridge, September 2015.
- “Introduction to Solar Fuels”, UKERC International Energy Summer School, Wyboston, July 2015.
- “Vinyllic and Allylic C-F Activation at Zirconium and Titanium”, Technische Universität Berlin, November 2012.
- “Die Hydrometallierung fluorierter Allene – Von isolierten Verbindungen zur katalytischen C-F-Aktivierung”, KIT, Karlsruhe, September 2010.
- “Hydrometalation of Fluoroallenes – From Isolated Compounds to Catalytic Hydrodefluorination”, Doctoral Training Centre GRK1582 ‘*Fluorine as a Key Element*’ Inauguration Symposium, Berlin, November 2009.

Selected Conference Presentations

- “Quantum dot surface engineering for photocatalytic solar fuels production” Recent Appointees in Materials Science Meeting, Exeter, September 2017 (talk).
- “Clean H₂ fuel from solar-driven lignocellulose reforming”, 2nd International Solar Fuels Conference, San Diego, July 2017 (talk).
- “Quantum dot surface engineering for photocatalytic syngas generation”, ADUC Chemiedozententagung, Marburg, March 2017 (talk).
- “Clean H₂ fuel from solar-driven biomass reforming”, 5th UK Solar Fuels Meeting, Newcastle, January 2017 (talk). Awarded ‘*Best Oral Presentation*’, Energy & Environmental Science.
- “Photocatalytic Reduction of Aqueous CO₂ Using CdS Quantum Dots and Molecular Nickel Catalysts”, 2nd UK-Japan Solar Fuels Workshop, Tokyo, June 2016 (flash presentation and poster).
- “Photocatalytic CO₂ Reduction in Water Using CdS Quantum Dots and Molecular Nickel Catalysts”, Gordon Research Conference *Renewable Energy: Solar Fuels*, Lucca, February 2016 (poster).
- “Photocatalytic CO₂ Reduction in Water Using CdS Quantum Dots and Molecular Nickel Catalysts”, 4th UK Solar Fuels Symposium, Cambridge, January 2016 (poster).
- “Photocatalytic Formic Acid Decomposition on CdS Nanocrystals with Controllable Selectivity for H₂ or CO”, ISACS17 Challenges in Chemical Renewable Energy, Rio de Janeiro, September 2015 (flash presentation and poster).
- “Vinyllic and Allylic C-F Activation at Zirconium and Titanium – Scope, Mechanism and the First Asymmetric Hydrodefluorination”, 25th International Conference on Organometallic Chemistry, Lisbon, September 2012 (talk).
- “Hydrometalation of Fluoroallenes – From Isolated Compounds to Catalytic C-F Bond Activation”, 16th European Symposium on Fluorine Chemistry, Ljubljana, July 2010 (talk).
- “Hydrometallierung, Carbometallierung und Metallometallierung fluorierter Allene“, 13^{ter} Deutscher Fluortag, Schmitten, October 2008 (talk).
- “Hydrometalation Reactions of Fluorinated Allenes”, 15th European Symposium on Fluorine Chemistry, Prague, July 2007 (talk).