Scientific curriculum vitae

Personal data

Name:	Benjamin Mockenhaupt
Academic degree:	Dr. rer. nat
Birth date:	13.10.1991
University address:	Universität Duisburg-Essen Technische Chemie I Universitätsstraße 7 45141 Essen
E-Mail:	benjamin.mockenhaupt@uni-due.de

Studies

09/2018-10/2023	**Promotion** at inorganic chemistry at university of Duisburg-Essen Main topic: Chemical engineering / catalysis Title: 'On the promotion effect of trivalent cations on zinc oxide and their influence on catalyst activity' Defense date: 20 October 2023, Note: magna cum laude
04/2016 – 05/2018	**Chemical- and biological engineering, M.Sc.**, University of Erlangen-Nuremberg, Erlangen, Main topic: chemical engineering / reaction engineering Degree: Master of Science Title: 'Optimierung von Raney®-Kupfer-Katalysatoren zur Anwendung in der Methanol-Synthese' Date: May 2018, Grade: 1.2 (30/120 ECTS credits)
10/2011 – 09/2016	**Chemical- and biological engineering, M.Sc.**, University of Erlangen-Nuremberg, Erlangen, Main topic: chemical engineering / reaction engineering Degree: Bachelor of Science Title: 'Kinetische Untersuchungen in der Dehydrierung von H18-MSH und H12-MLH' Date: September 2014, Grade: 1.6 (15/187.5 ECTS credits)
2002 - 2011	**Abitur**, *privates Gymnasium der Zisterzienserabtei Marienstatt*, Hachenburg Degree: general university entrance qualification

Peer reviewed publications

1. L. Pandit, A. Boubnov, G. Behrendt, **B. Mockenhaupt**, C. Chowdhury, J. Jelic, A.-L. Hansen, E. Saraçi, E.-J. Ras, M. Behrens, F. Studt, J.-D. Grunwaldt, ChemCatChem 2021, 13, 4120.
2. G. Behrendt, **B. Mockenhaupt**, N. Prinz, M. Zobel, E.-J. Ras, M. Behrens, ChemCatChem 2022, 14, e202200299.

3. **Mockenhaupt, B.**, Özcan, F., Dalebout, R., Mangelsen, S., Machowski, T., de Jongh, P.E. and Behrens, M. (2022), Chemie Ingenieur Technik, 94: 1784-1797. DOI: 10.1002/cite.202200171.

4. **Benjamin Mockenhaupt**, Philipp Schwiderowski, Jelena Jelic, Felix Studt, Martin Muhler, and Malte Behrens, The Journal of Physical Chemistry C 2023 127 (7), 3497-3505, DOI: 10.1021/acs.jpcc.2c08823

5. **Mockenhaupt, B.**, Wied, J. K., Mangelsen, S., Schürmann, U., Kienle, L., auf der Günne, J. S., and Behrens, M. (2023), *Dalton Transactions, 52*(16), 5321-5335. DOI: 10.1039/D3DT00253E.

6. Jan Konrad Wied, **Benjamin Mockenhaupt**, Ulrich Schürmann, Lorenz Kienle, Sebastian Mangelsen, Janin Glänzer, Vinicius Ribeiro Celinski, Malte Behrens, and Jörn Schmedt auf der Günne, *Analytical Chemistry* **2024** *96* (28), 11290-11298, DOI: 10.1021/acs.analchem.4c01170

7. **Benjamin Mockenhaupt**, Jil Gieser, Sharif Najafishirtari, Lorena Baumgarten, Jelena Jelic, Thomas Lunkenbein, Erik-Jan Ras, Jan-Dierk Grunwaldt, Felix Studt, Malte Behrens, *Journal of Catalysis*, Volume 439, **2024**, 115785, ISSN 0021-9517, DOI: 10.1016/j.jcat.2024.115785

Publication submitted

8. Wied, J. K., **Mockenhaupt, B.**, Mangelsen, S., Schürmann, U., Kienle, L., Behrens, M., Schmedt auf der Günne, J., Structural Changes Induced by the Promoter Ga in Nanocrystalline ZnO Support Used in Methanol Catalysis. ChemRxiv. 2025; doi:10.26434/chemrxiv-2025-170hh, this content is a preprint and has not been peer-reviewed.

Scientific career

03/2025-today	**Group lead of catalysis group,** *University of Duisburg-Essen, Group of Prof. Barcikowski*, Essen, heterogeneous catalysis Assumption of group leadership in the field of catalysis. Synthesis of catalysts using laser processing and testing in electrocatalytic setups as well as in thermal catalysis.
02/2025-02/2025	**Scientific assistant**, *University of Kiel, Group of Prof. Behrens*, Kiel, heterogeneous catalysis Commissioning of a chemisorption and catalysis system that was developed as part of the doctoral research.
09/2022 – 01/2025	**Scientific assistant**, *Delft University of Technology, Group of Prof. Urakawa*, Delft (Netherlands), Catalyst engineering Development of catalysts for CO_2 hydrogenation to methanol. Catalyst screening in a high-pressure setup and operando spectroscopic characterization of the synthesized catalysts.

10/2021 – 08/2022 **Scientific assistant**, *University of Kiel, Group of Prof. Behrens,* Kiel, heterogeneous catalysis

Support in establishing the gas infrastructure, particularly the high-pressure laboratories for gas-phase catalysis research, as well as in the transfer of laboratory facilities from Essen to Kiel and the associated knowledge transfer of the former research group. Assisted in the setup and commissioning of transferred systems. Developed standardized catalytic testing protocols tailored to specific scientific questions.

Additional activities included:

Co-precipitation
Catalytic testing
Gas-phase chemistry
Catalyst modification via impregnation
Chemisorption and physisorption measurements
Responsibility for gas cylinder storage and procurement
Data analysis using MATLAB
Supervision of students and mentoring of early-career researchers

10/2018 – 04/2022 **Scientific assistant**, *University of Duisburg-Essen, Group of Prof. Behrens*, Essen, heterogeneous catalysis

Co-precipitation of solid materials, characterization of solids, setup of a system for catalyst testing and characterization, support of the gas-phase laboratory, implementation and operation of physisorption and chemisorption measurements, characterization of gas-phase catalysts, system characterization and calibration (mass spectrometry), planning of individual gas-phase catalysis experiments carried out at partner institutions, planning and support of beamtime activities within the framework of Priority Program 2080 (SPP 2080) of Prof. Grunwaldt's group, supervision of students, and assistance in inorganic chemistry lab courses for undergraduate students.

11/2017 – 04/2018 **Master student** at the chair of chemical reaction engineering, *University of Erlangen, Group of Prof. Wasserscheid,* Erlangen, heterogeneous catalysis and chemical reaction engineering.

Investigation and optimization of Raney copper catalysts for methanol synthesis as an application for structured reactors.

07/2015 - 02/2016 **Assistant scientist**, *University of Erlangen, Group of Prof. Wasserscheid*, Erlangen, heterogeneous catalysis and chemical reaction engineering.

Modification of heterogeneous catalysts, operation of a continuous dehydrogenation unit, maintenance and repair of analytical instruments and reactors/systems, literature research, modification of batch and fed-batch systems (including engineering aspects), and organic synthesis.

10/2014 - 03/2015 **Intern**, *Integrated LabSolutions GmbH, Dr. A. Nagy,* Berlin, heterogeneous catalysis and plant engineering.

Creation of P&IDs, cost estimation/support for budget planning, design review, safety analysis/risk assessment/alarm matrix development, engineering, selection and procurement of components, development of solution proposals for specific technical challenges, support and participation in plant construction, and setup of test systems to address specific problems.

04/2014 - 09/2014	**Bachelor student** at the chair of chemical reaction engineering, *University of Erlangen, Group of Prof. Wasserscheid,* Erlangen, heterogeneous catalysis and chemical reaction engineering. Kinetic studies on the dehydrogenation of H18-dibenzyltoluene and H12-benzyltoluene in the context of hydrogen storage technology using liquid organic hydrogen carriers (LOHC).
06/2012 - 03/2013	**Team leader**, *"Drop your Thesis!2013" of ESA-Education, University of Erlangen, Group of Prof. Pöschel,* Erlangen, Multi scale simulation (MSS) Planning and design of the experimental setup, budget planning, engineering, team leadership, funding application, campaign planning, experimental planning/pre-evaluation, travel planning/organization, safety analysis of the setup in collaboration with Drop Tower Bremen, and preparation of a short report.
04/2012 - 02/2014	**Assistant scientist**, *University of Erlangen, Group of Prof. Wasserscheid*, Erlangen, heterogeneous catalysis and chemical reaction engineering. Kinetic investigation of dehydrogenation reactions of LOHCs, screening tests of dehydrogenation and hydrogenation reactions, screening of commercial catalysts for dehydrogenation and hydrogenation reactions, preparation and optimization of GC analyses, evaluation of measurement data, maintenance of stirred tank reactors (batch).

Courses and Workshops

16.06.2019- 21.06.2021	3rd European Summer School on Catalyst Preparation, Vogüé, France, 2019
25.02.2019- 01.03.2019	LabVIEW Core 1 and Core 2, Aachen, Germany, 2019
10/2018 – 04/2019	Graduate study course of the Catalysis Institute Ruhr, Bochum, Germany, 2019

Membership

Verein Deutscher Ingenieure (VDI)

Other qualifications

Language

Deutsch	Mother language
English	Level B2
French	Level B1

Duisburg, den 08.05.2025

Benjamin Mockenhaupt