

Dr.-Ing. Christoph Held

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Personal Information

Date of birth: December 5th 1980
Place of birth: Bogen
Marital status: married, four children
Nationality: German

Scientific Education

2002 - 2007 Study at TU Dortmund University

Chemical Engineering (Diploma)
Final Grade 1,7

2007 - 2011 Ph.D. at TU Dortmund University

Promotion zum Thema: „*Measuring and Modeling Thermodynamic Properties of Biological Solutions*“ am Lehrstuhl für Thermodynamik (Prof. Dr. Gabriele Sadowski)
Final Grade summa cum laude

2012 – 2017 Habilitation at TU Dortmund University

Group Leader „Bioreactions and Biothermodynamics“, Laboratory of Thermodynamics (Prof. Dr. Gabriele Sadowski)
Position: Academic councillor

2018 – now Academic senior councillor at TU Dortmund University

Group Leader „Bioreactions and Biothermodynamics“, Laboratory of Thermodynamics (Prof. Dr. Gabriele Sadowski)

Research Focus

2012 – today Bioreactions and Biothermodynamics

Research on thermodynamics of biochemical mixtures and reactive systems

- Thermodynamics of enzyme-catalyzed reactions
 - Metabolic reactions
 - Influence of additives on reactions
 - Bioreactions in new solvents
 - Bioreactions under high pressure
 - Kinetics of bioreactions
- Phase separation of complex media with extraction
 - Extraction with new solvents
 - Influence of additives (e.g. salts) on aqueous/organic extraction
- Thermodynamic properties of biological mixtures
 - Measuring and modelling phase behaviour of complex multi-component biological mixtures

Awards

Thermodynamik-Kolloquium 2010

Best presentation of the conference

Syngenta Challenge 2013

Best prediction results of an international modeling challenge on phase behavior of benzoic acid

EFCE award 2013

Best Ph.D. thesis in TTP (Thermodynamics and Transport Properties) in Europe in the years 2011-2012

Teaching award 2015

Of the Department BCI (TU Dortmund)

Hochschullehrernachwuchs-Award 2016 of the DECHEMA e.V.

Max-Buchner-Award 2017 of the DECHEMA e.V.

AVEVA-Award 2018

Winner of the First University Research and Development Programme

Arnold-Eucken Award 2018 of the VDI

Young talent award for process engineering for the years 2016-2017

Cooperation partners

- Prof. Eugenia Macedo, University Porto (exchange of Ph.D. students, common publications and projects)
- Prof. Xiaoyan Ji, University Lund, Sweden (exchange common publications)
- Prof. Joao Coutinho, University Aveiro, Portugal (exchange of students und common publications)
- Prof. Werner Kunz, University Regensburg (common publications and projects)
- Prof. Gerhard Schembecker, TU Dortmund (common publications)
- PD Thomas Maskow, UFZ Leipzig (common publications and projects)
- Prof. Sergey Verevkin, University Rostock (common publications and projects)
- Prof. Cyrus Ghotbi, University Teheran, Iran (exchange of Ph.D. students and common publications)
- Prof. Christoph Schick, University Rostock, (common publications and projects)
- Dr. Jakob Albert, FAU Erlangen Nürnberg (common publications and projects)
- Maaïke Kroon, TU Eindhoven and Khalifa University (Abu Dhabi, United Arab Emirates), common publications
- Cor Peters, Khalifa University (Abu Dhabi, United Arab Emirates), common publications

Function as reviewer

- Reviewer of international journals:
Fluid Phase Equilibria, Industrial & Engineering Chemistry Research, Journal of Chemical Thermodynamics, Journal of Chemical Engineering Data, Chemical Engineering Science, ACS Sustainable Chemistry & Engineering, Angewandte Chemie Int. Ed., Trends in Biotechnology, Processes, Molecules
- Reviewer of national (German) and international research proposals

Academic self-administration

- Member of the committee for teaching and study, BCI TU Dortmund 2008-2014
- Member of the faculty board, BCI TU Dortmund 2014-2018

Third-party funds

Third-party funds since 2014, partially together with Prof. G. Sadowski:

- 2014: 0.3 Mio €
- 2015: 0.4 Mio €
- 2016: 0.3 Mio €
- 2017: 0.4 Mio €
- 2018: 0.4 Mio €

The third-party funds were granted by DFG, AiF, DAAD, CLIB Graduate Cluster, RESOLV, AVEVA, Max-Buchner.

Supervised Ph.D. students

2013-2014

- Dr. Alexander Nann "Thermodynamics for the Extraction of Biobutanol Using Ionic Liquids"
- Philipp Hoffmann "The role of activity coefficients for bioreactions"

2013-2016

- Dr. Sultan Mohammad "Salt Influence on Liquid-Liquid Equilibria"

2013-2017

- Florian Meurer "Thermodynamic equilibrium of highly exergonic metabolic reactions"
- Dr. Emrah Altuntepe "Thermodynamics of enzyme-catalysed reactions in organic media"

2014-2017

- Dr. Matthias Voges "Effects of Concentration and Additives on Thermodynamic Equilibria of Enzyme-catalyzed Reactions"

Since 2016

- Anton Wangler "Co-Solvent Effects on Thermodynamic Equilibria and Kinetics of Enzyme-catalyzed Reactions"

Since 2017

- Michael Knierbein "Influence of Pressure on Thermodynamic Equilibria and Kinetics of (Bio-)chemical Reactions"
- Mark Bülow "ε-ePC-SAFT: A new Development for Predicting Solubility in Highly Concentrated Salt Solutions"
- Thorsten Greinert "Thermodynamic Equilibria of Metabolic Reactions within Glycolysis"
- Kamila Wysoczanska "Solubility and Partitioning Behavior of Vitamins"

Since 2018

- Hoang Tam Do "Predicting and Validation Solubility Behavior of Peptides"

Publications and book contributions

- Since 2008: more than 70 publications in international journals and two book chapters
- See „List of publications“, H-Factor 19
- Five most important publications:
 - C. Held, L. Cameretti, G. Sadowski **"Modeling of Aqueous Electrolyte Solutions. Part1 Fully Dissociated Electrolytes"** *Fluid Phase Equilibria* 270 (2008) 87-96
 - Held C.; Sadowski G.: **"Thermodynamics of Bioreactions"**, *Annual Review of Chemical and Biomolecular Engineering* 7 (2016) 395-414
 - Chua YZ.; Do HT.; Schick C.; Held C. **"New experimental melting properties as access for predicting amino-acid solubility"**, *RSC Advances* 8 (2018) 6365-6372
 - Wangler A.; Sieder G.; Ingram T.; Heilig M.; Held C. **"Prediction of CO₂ and H₂S solubility and enthalpy of absorption in reacting N-methyldiethanolamine/water systems with ePC-SAFT"**, *Fluid Phase Equilibria* 461 (2018) 15-27
 - Wangler A.; Böttcher D.; Hüser A.; Sadowski G.; Held C. **"Prediction and validation of co-solvent influence on Michaelis constants: A thermodynamic activity-based approach"** *European Journal of Chemistry*, 10.1002/chem.201803573, 2018

Conference contributions

- Since 2008: > 80 contributions (posters/oral) at national and international conferences
- See „List of publications“
- Five most important talks:
 - **"Optimizing reaction media for biocatalysis"** Invited Talk, ProcessNet-Jahrestagung und 33. DECHEMA-Jahrestagung der Biotechnologen 2018, 10. - 13. September 2018, Aachen, Germany
 - **"Predicting partition and reaction in biosystems: How far can we go with PC-SAFT?"** Invited Talk, SAFT Conference, 11.-13. May 2017, Heidelberg, Germany
 - **"Application of Thermodynamics to Bioreactions"** PPEPPD 2016, 22.-26. May 2016, Porto, Portugal
 - **"Reaktionsgleichgewichte biologisch relevanter Reaktionen"** Invited Talk, Thermodynamik-Kolloquium 22.-24. September 2014, Stuttgart, Germany
 - **"PC-SAFT equation of state: Modelling thermodynamic properties and phase equilibria of systems containing ILs"** Invited Talk EXIL-Workshop „Liquid/liquid extraction by use of ILs" 24.-26. April 2014, Strasbourg, France