

**IWW Water Centre
(affiliated institute of the
University Duisburg-Essen)**

Main Activities

- Applied Research
- Consulting, mainly for the Water Industry
- Advanced Training, Knowledge Transfer

in the following core areas:

- Water Resources Management
- Water Technology
- Water Networks
- Water Quality
- Applied Microbiology
- Management Consulting

WWW: <http://www.iww-online.de>

**Center for Water and
Environmental Research (ZWU)**

Mission

- Bringing together top research in the field at UDE and in the Ruhr area
- Centre for international water education (Master and PhD)
- International research cooperations

Vision

Further Development of a Water Alliance Ruhr

WWW: <http://www.uni-due.de/zwu>

Selected Publications

S. Wiese, T. Teutenberg, T. C. Schmidt: A general strategy for performing temperature programming in high performance liquid chromatography – Prediction of linear temperature gradients. *Anal. Chem.* 83 (6) (2011), 2227-2233

J. Laaks, M. A. Jochmann, B. Schilling, T. C. Schmidt: In-tube Extraction of volatile organic compounds from aqueous samples: an economical alternative to purge and trap enrichment. *Anal. Chem.* 82 (2010), 7641-7648

S. Endo, P. Grathwohl, S. B. Haderlein, T. C. Schmidt: LFERs for Soil Organic Carbon–Water Distribution Coefficients (KOC) at Low Sorbate Concentrations. *Environ. Sci. Technol.* 43 (9) (2009), 3094-3100

J. P. Pocostales, M. M. Sein, W. Knolle, C. von Sonntag, T. C. Schmidt: Degradation of Ozone-Refractory Organic Phosphates in Wastewater by Ozone and Ozone/Hydrogen Peroxide (Peroxone): The Role of Ozone Consumption by Dissolved Organic Matter. *Environ. Sci. Technol.* 44 (2010), 8248–8253

M. A. Jochmann, M. Blessing, S. B. Haderlein, T. C. Schmidt: A new approach to determine method detection limits for compound-specific isotope analysis of volatile organic compounds. *Rapid Commun. Mass Spectrom.* 20 (2006), 3639-3648

M. Blessing, T. C. Schmidt, R. Dinkel, S. B. Haderlein: Delineation of multiple chlorinated ethene sources in an industrialized area – A forensic field study using compound-specific isotope analysis. *Environ. Sci. Technol.* 43 (2009), 2701-2707

Project Funding

DFG, EU, BMBF, BMWi, State Ministeries, IPSWaT, DBU, Water Chemical Society, AiF, Industry

Teaching

- Analytical Chemistry
- Statistics and Chemometrics
- Water Chemistry and Analysis
- Stable Isotope Analysis
- Quality Management
- Oxidative Processes

Instrumental Analytical Chemistry



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Research Areas

Stable Isotope Analysis (Dr. Maik Jochmann / Prof. Torsten Schmidt)



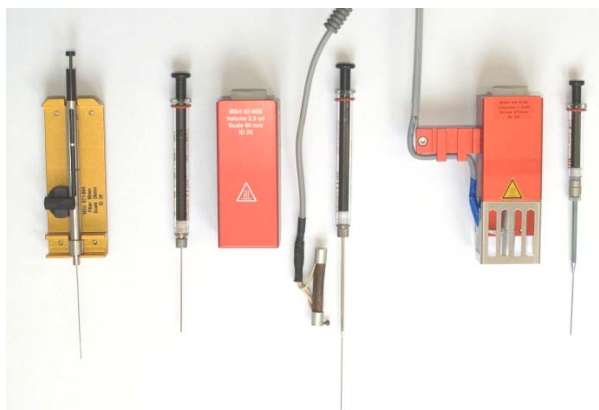
- Development, validation and application of compound-specific stable isotope analysis (CSIA) using gaschromatography and liquid chromatography coupled to isotope ratio mass spectrometry.
- Development of high-temperature LC separations using purely aqueous eluents for LC the hyphenation.
- Current applications: methane oxidation, biomethylation of metals, product authenticity, pesticide degradation.

Liquid Chromatography and LC-MS

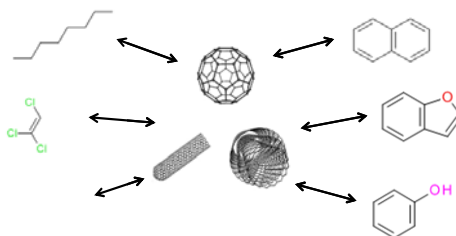
- Fundamentals of high-temperature LC and LCxLC (coop. T. Teutenberg).
- Characterization of surface-active pesticide formulation ingredients.
- Rapid and sensitive determination of pesticide metabolites in aqueous samples using UPLC-MS (coop. F. Werres)

Microextraction Techniques and Gaschromatography (Dr. Maik Jochmann / Prof. Torsten Schmidt)

- Development, validation and application of microextraction techniques in sample preparation for volatile and semivolatile compounds.
- GCxGC-MS for the ultratrace determination of aromatic amines in complex mixtures.
- Determination of hydrophobic compounds in water samples rich in particular matter and in street dusts.



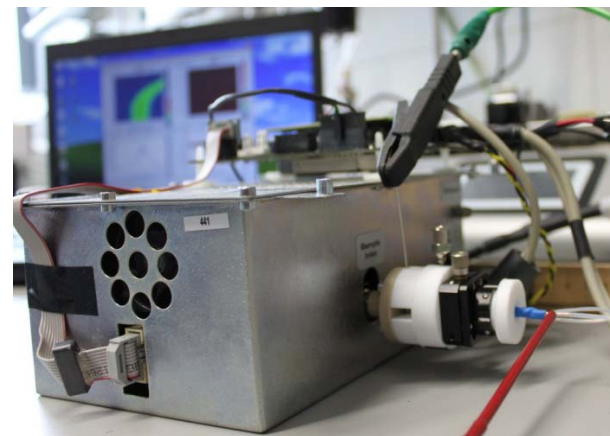
Phase-transfer Processes at Aqueous Interfaces



- Characterization and quantification of molecular-level mechanisms of sorption, using chemical probes and polyparameter linear free energy relationships
- Carbon Nanomaterials

Ion Mobility Spectrometry (PD Dr. Ursula Telgheder)

Development and application of sample-introduction systems coupled to ion-mobility spectrometry (IMS and FAIMS/DMS) for the robust on-site screening analysis of contaminants in water samples.



Advanced Oxidation Processes

- Fundamental concepts in advanced oxidation processes such as peroxone, Fenton, sulfate radicals, UV and nonthermal plasmas
- Kinetics, product formation and reaction mechanisms in the removal of micropollutants from raw and wastewater (coop. J. Türk)
- Formation of oxidation byproducts

