

Forschung (index.php?de=34208) > Nachhaltige Technologien für die Umwelt (index.php?de=43276)
> Technische Biogeochemie (index.php?de=34235) > Team (index.php?de=37466)
> Steffen Kümmel (index.php?de=39966)

Steffen Kümmel

Kontakt / Adresse

E-mail:

✉ steffen.kuettel@ufz.de (mailto:steffen.kuettel@ufz.de)

Tel.: +49 (0) 341 6025 1362

Fax: +49 (0) 341 6025 1443

Einstellungen zum Datenschutz

Department Technische Biogeochemie
Helmholtz Zentrum für Umweltforschung - UFZ
Permoserstraße 15,
04318 Leipzig

Wir verwenden Cookies, die für die grundlegende Funktionalität unserer Website erforderlich sind, damit diese stetig für Sie optimiert und deren Nutzerfreundlichkeit verbessert werden kann. Darüber hinaus setzen wir das Webanalysetool Matomo ein, welches Daten anonymisiert trackt. Dadurch ist es uns möglich die Nutzung unserer Website statistisch auswerten. Ihre Einwilligung zur Nutzung von Matomo kann jederzeit über die Datenschutzerklärung (<https://www.ufz.de/index.php?de=44326>) widerrufen werden.

Nicht zustimmen

Zustimmen



Curriculum Vitae

seit 2022 Wissenschaftlicher Labormanager des Isotopenlabors - Leipzig, Department Technische Biogeochemie (bis 2023 Isotopen Biogeochemie), UFZ

2016 – PostDoc, Department Isotopen Biogeochemie, UFZ
2022

2011 – Doktorand, Universität Freiburg (Fakultät für Biologie) und UFZ (Department Isotopen
2016 Biogeochemie)

2008 – Master of Science in Biochemie, Universität Leipzig
2010

2005 – Bachelor of Science in Biochemie, Universität Leipzig
2008

Research

Mein Hauptinteresse gilt der Entwicklung von Analysemethoden für stabile Isotope, um das Verständnis für den Lebenszyklus von Chemikalien in der Umwelt zu verbessern. Meine Forschung konzentriert sich auf die Online-Analyse stabiler Isotope, z. B. mit Hilfe von Elementaranalysatoren (EA), Gaschromatographie (GC) oder Flüssigchromatographie (LC), die mit Konversionseinheiten und Massendetektoren gekoppelt sind, wie z. B. Isotopen-Verhältnis-Massenspektrometer (IRMS) und Massenspektrometrie mit induktiv gekoppeltem Plasma (MC-ICPMS). Weitere Informationen über mein Fachwissen und die technischen Möglichkeiten unsers Labors finden Sie auf der ➔ **LSI website** (<https://www.ufz.de/index.php?en=49773>).

Publications & other contributions

Inhalt:

- 2026 (2)
- 2025 (12)
- 2024 (21)
- 2023 (9)
- 2022 (7)
- 2021 (5)
- 2020 (7)
- 2019 (4)
- 2018 (7)
- 2017 (2)
- 2016 (2)
- 2015 (2)

- 2014 (1)
- 2013 (1)

Weiterführende Recherchen können Sie in unserem ➔ [Publikationsverzeichnis](https://www.ufz.de/index.php?de=20939) (<https://www.ufz.de/index.php?de=20939>) durchführen.

2026 (2)

- Gao, S., Koch, B.P., **Kümmel, S.**, Tebben, J., Lechtenfeld, O.J. (2026):
Determination of stable carbon isotope ratios for molecules in natural organic matter using ESI FT-ICR MS (https://www.ufz.de/index.php?de=20939&pub_id=32369)
Sci. Adv. **12** (25), eae5238
10.1126/sciadv.aee5238 (<https://doi.org/10.1126/sciadv.aee5238>)
- Phillips, E., De Vera, J., **Kümmel, S.**, Bulka, O., Chen, W., Edwards, E., Nijenhuis, I., Gehre, M., Sherwood Lollar, B. (2026):
Isotopic fractionation and masking effects during biotransformation of chlorinated ethanes (https://www.ufz.de/index.php?de=20939&pub_id=32562)
Environ. Sci. Technol. **60** (22), 15940 - 15951
10.1021/acs.est.5c14089 (<https://doi.org/10.1021/acs.est.5c14089>)

➔ [zum Inhalt](#)

2025 (12)

- Camin, F., Besic, D., Brewer, P.J., Allison, C.E., Coplen, T.B., Dunn, P.J.H., Gehre, M., Gröning, M., Meijer, H.A.J., Hélie, J.-F., Iacumin, P., Kraft, R., Krajnc, B., **Kümmel, S.**, Lee, S., Meija, J., Mester, Z., Mohn, J., Moossen, H., Qi, H., Skrzypek, G., Sperlich, P., Viallon, J., Wassenaar, L.I., Wielgosz, R.I. (2025):
Stable isotope reference materials and scale definitions — Outcomes of the 2024 IAEA experts meeting (https://www.ufz.de/index.php?de=20939&pub_id=31119)
Rapid Commun. Mass Spectrom. **39** (14), e10018
10.1002/rcm.10018 (<https://doi.org/10.1002/rcm.10018>)
- Haenelt, S., Akay, C., Richnow, H.-H., **Kümmel, S.**, Stryhanyuk, H., Müller, J.A., Musat, N. (2025):
Compartment-specific effect of sulfamethoxazole at low µg/L concentrations on microbial nitrogen assimilation in a river system (https://www.ufz.de/index.php?de=20939&pub_id=31150)
Water Res. X **28**, art. 100390
10.1016/j.wroa.2025.100390 (<https://doi.org/10.1016/j.wroa.2025.100390>)
- Haluska, A.A., Blendinger, E., Rügner, H., Buchner, D., Duda, J.-P., Thiel, V., Blumenberg, M., Ostertag-Henning, C., **Kümmel, S.**, Grathwohl, P. (2025):
Hydrocarbons, hydrogen, and organic acids generation by ball milling and batch incubation of sedimentary rocks (https://www.ufz.de/index.php?de=20939&pub_id=29723)
Appl. Geochem. **178**, art. 106160
10.1016/j.apgeochem.2024.106160 (<https://doi.org/10.1016/j.apgeochem.2024.106160>)
- Hauer, A., Zuev, A., Chatzinotas, A., Jurburg, S., **Kümmel, S.**, Potapov, A. (2025):
Tracking assimilation of microbial biomass, leaf litter and artificially created soil organic matter by soil fauna using multi-resource stable isotope labelling (https://www.ufz.de/index.php?de=20939&pub_id=31112)
Eur. J. Soil Biol. **126**, art. 103752
10.1016/j.ejsobi.2025.103752 (<https://doi.org/10.1016/j.ejsobi.2025.103752>)
- Kempf, K., **Kümmel, S.**, Gehre, M., Kempf, O., Steinberg, P., Molkentin, J., Münch, S., Jira, W. (2025):
A comprehensive view on the fate of ¹⁵N isotope-labeled nitrite in model systems for cured and heated

sausages (https://www.ufz.de/index.php?de=20939&pub_id=31165)

Food Chem. **493**, Part 2 , art. 145755

10.1016/j.foodchem.2025.145755 (<https://doi.org/10.1016/j.foodchem.2025.145755>)

- Khaliq, S., Schlenker, A., **Kümmel, S.**, Höhn, D., Jochmann, M.A., Kerpen, K., Fink, P., Weitere, M., Schmidt, T.C. (2025):
Spatial and temporal patterns of *Gammarus* sp. in lowland streams analyzed through amino acid isotope analysis (https://www.ufz.de/index.php?de=20939&pub_id=31534)
Int. Rev. Hydrobiol. **110** (2), 151 - 165
10.1002/iroh.70024 (<https://doi.org/10.1002/iroh.70024>)
- **Kümmel, S.**, Ottosen, C.F., Olsson, M.E., Broholm, M.M., Bjerg, P.L., Richnow, H.H. (2025):
Development of a ^{13}C and ^{34}S isotope analysis method for sulfadimidine and its potential to trace contaminant transformation in groundwater systems (https://www.ufz.de/index.php?de=20939&pub_id=30447)
Anal. Chem. **97** (7), 4014 - 4020
10.1021/acs.analchem.4c05625 (<https://doi.org/10.1021/acs.analchem.4c05625>)
- Liu, X., Köpke, J., Akay, C., **Kümmel, S.**, Imfeld, G. (2025):
Sulfamethoxazole transformation by heat-activated persulfate: Linking transformation products patterns with carbon and nitrogen isotope fractionation (https://www.ufz.de/index.php?de=20939&pub_id=30573)
Environ. Sci. Technol. **59** (11), 5704 - 5714
10.1021/acs.est.4c09732 (<https://doi.org/10.1021/acs.est.4c09732>)
- Min, N., Yao, J., Li, H., **Kümmel, S.**, Schaefer, T., Hermann, H., Richnow, H.H. (2025):
Multi-element isotope fractionation analysis to investigate the photosensitized reactions of humic substance with 3-chloroaniline (https://www.ufz.de/index.php?de=20939&pub_id=30745)
Water Res. **282** , art. 123633
10.1016/j.watres.2025.123633 (<https://doi.org/10.1016/j.watres.2025.123633>)
- Min, N., Yao, J., Li, H., **Kümmel, S.**, Schaefer, T., Herrmann, H., Richnow, H.H. (2025):
Carbon, hydrogen, nitrogen and chlorine isotope fractionation during 3-chloroaniline transformation in aqueous environments by direct photolysis, TiO_2 photocatalysis and hydrolysis
(https://www.ufz.de/index.php?de=20939&pub_id=30203)
Water Res. **273** , art. 122956
10.1016/j.watres.2024.122956 (<https://doi.org/10.1016/j.watres.2024.122956>)
- Wang, Z., Yang, Y., **Kümmel, S.**, Richnow, H.-H., Nijenhuis, I., Vogt, C. (2025):
Heterotrophic nitrate reduction potential of an aquifer microbial community from psychrophilic to thermophilic conditions (https://www.ufz.de/index.php?de=20939&pub_id=30469)
Sci. Total Environ. **967** , art. 178716
10.1016/j.scitotenv.2025.178716 (<https://doi.org/10.1016/j.scitotenv.2025.178716>)
- Yu, H., Ma, L., **Kümmel, S.**, Liu, X., Schaefer, T., Herrmann, H., Richnow, H.-H. (2025):
Multi-element compound-specific stable isotope analysis (^2H , ^{13}C , ^{15}N , $^{33/34}\text{S}$) to characterize the mechanism of sulfate and hydroxyl radical reaction and photolysis of benzothiazole
(https://www.ufz.de/index.php?de=20939&pub_id=30650)
Water Res. **279** , art. 123479
10.1016/j.watres.2025.123479 (<https://doi.org/10.1016/j.watres.2025.123479>)

➔ zum Inhalt

- Abbas, G., Jomaa, S., Fink, P., Brosinsky, A., Nowak, K.M., **Kümmel, S.**, Schkade, U.-K., Rode, M. (2024):
Investigating sediment sources using compound-specific stable isotopes and conventional fingerprinting methods in an agricultural loess catchment (https://www.ufz.de/index.php?de=20939&pub_id=29607)
Catena **246**, art. 108336
10.1016/j.catena.2024.108336 (<https://doi.org/10.1016/j.catena.2024.108336>)
- Burr, D.J., Drauschke, J., Kanevche, K., **Kümmel, S.**, Stryhanyuk, H., Heberle, J., Perfumo, A., Elsaesser, A. (2024):
Stable isotope probing-nanoFTIR for quantitation of cellular metabolism and observation of growth-dependent spectral features (https://www.ufz.de/index.php?de=20939&pub_id=28721)
Small **20** (36), art. 2400289
10.1002/sml.202400289 (<https://doi.org/10.1002/sml.202400289>)
- Chen, S.-C., Chen, S., Musat, N., **Kümmel, S.**, Ji, J., Braad Lund, M., Gilbert, A., Lechtenfeld, O.J., Richnow, H.-H., Musat, F. (2024):
Energetics of archaeal anaerobic oxidation of butane (https://www.ufz.de/index.php?de=20939&pub_id=30067)
figshare
10.6084/m9.figshare.25499440.v1 (<https://doi.org/10.6084/m9.figshare.25499440.v1>)
- Chen, S.-C., Chen, S., Musat, N., **Kümmel, S.**, Ji, J., Braad Lund, M., Gilbert, A., Lechtenfeld, O.J., Richnow, H.-H., Musat, F. (2024):
Back flux during anaerobic oxidation of butane supports archaea-mediated alkanogenesis (https://www.ufz.de/index.php?de=20939&pub_id=30066)
Nat. Commun. **15**, art. 9628
10.1038/s41467-024-53932-9 (<https://doi.org/10.1038/s41467-024-53932-9>)
- Hofstetter, T.B., Bakkour, R., Buchner, D., Eisenmann, H., Fischer, A., Gehre, M., Haderlein, S.B., Höhener, P., Hunkeler, D., Imfeld, G., Jochmann, M.A., **Kümmel, S.**, Martin, P.R., Pati, S.G., Schmidt, T.C., Vogt, C., Elsner, M. (2024):
Perspectives of compound-specific isotope analysis of organic contaminants for assessing environmental fate and managing chemical pollution (https://www.ufz.de/index.php?de=20939&pub_id=29029)
Nat. Water **2** (1), 14 - 30
10.1038/s44221-023-00176-4 (<https://doi.org/10.1038/s44221-023-00176-4>)
- Horst, A., Gehre, M., Fahle, M., **Kümmel, S.** (2024):
Continuous-flow stable sulfur isotope analysis of organic and inorganic compounds by EA-MC-ICPMS (https://www.ufz.de/index.php?de=20939&pub_id=29071)
Anal. Chem. **96** (21), 8510 - 8517
10.1021/acs.analchem.4c00439 (<https://doi.org/10.1021/acs.analchem.4c00439>)
- Khan, M.I., Yoo, K., Schwab, L., **Kümmel, S.**, Nijenhuis, I. (2024):
Characterization of anaerobic biotransformation of hexachlorocyclohexanes by novel microbial consortia enriched from channel and river sediments (https://www.ufz.de/index.php?de=20939&pub_id=29350)
J. Hazard. Mater. **476**, art. 135198
10.1016/j.jhazmat.2024.135198 (<https://doi.org/10.1016/j.jhazmat.2024.135198>)
- Lennartz, S., Byrne, H.A., **Kümmel, S.**, Krauss, M., Nowak, K.M. (2024):
Hydrogen isotope labeling unravels origin of soil-bound organic contaminant residues in biodegradability testing [Dataset] (https://www.ufz.de/index.php?de=20939&pub_id=29845)
figshare
10.6084/m9.figshare.25954396.v1 (<https://doi.org/10.6084/m9.figshare.25954396.v1>)

- Lennartz, S., Byrne, H.A., **Kümmel, S.**, Krauss, M., Nowak, K.M. (2024):
Hydrogen isotope labeling unravels origin of soil-bound organic contaminant residues in biodegradability testing (https://www.ufz.de/index.php?de=20939&pub_id=29798)
Nat. Commun. **15** , art. 9178
10.1038/s41467-024-53478-w (<https://doi.org/10.1038/s41467-024-53478-w>)
- Liu, X., Akay, C., Köpke, J., **Kümmel, S.**, Richnow, H.H., Imfeld, G. (2024):
Direct phototransformation of sulfamethoxazole characterized by four-dimensional element compound specific isotope analysis (https://www.ufz.de/index.php?de=20939&pub_id=29178)
Environ. Sci. Technol. **58** (23), 10322 - 10333
10.1021/acs.est.4c02666 (<https://doi.org/10.1021/acs.est.4c02666>)
- Liu, X., **Kümmel, S.**, Wu, L., Richnow, H.H. (2024):
Tracking the transformation of persistent organic pollutants in food webs using multi element isotope and enantiomer fractionation (https://www.ufz.de/index.php?de=20939&pub_id=28925)
J. Hazard. Mater. **469** , art. 134046
10.1016/j.jhazmat.2024.134046 (<https://doi.org/10.1016/j.jhazmat.2024.134046>)
- Nassery, H.R., Shahsavari, A.A., Vogt, C., **Kümmel, S.**, Kuntze, K., Khodaei, K., Nikpeyman, Y., Richnow, H.-H. (2024):
Source differentiation of BTEX compounds in groundwater contaminated due to refinery activities (https://www.ufz.de/index.php?de=20939&pub_id=29553)
J. Environ. Manage. **366** , art. 121893
10.1016/j.jenvman.2024.121893 (<https://doi.org/10.1016/j.jenvman.2024.121893>)
- Ottosen, C.F., Bjerg, P.L., **Kümmel, S.**, Richnow, H.H., Middeldorp, P., Draborg, H., Lemaire, G.G., Broholm, M.M. (2024):
Natural attenuation of sulfonamides and metabolites in contaminated groundwater – Review, advantages and challenges of current documentation techniques (https://www.ufz.de/index.php?de=20939&pub_id=28882)
Water Res. **254** , art. 121416
10.1016/j.watres.2024.121416 (<https://doi.org/10.1016/j.watres.2024.121416>)
- Pasqualini, J., Graeber, D., Bartusch, A., **Kümmel, S.**, Duran Hernandez, Z.L., Musat, N., Sunjidmaa, N., Weitere, M., Brauns, M. (2024):
Disentangling effects of multiple agricultural stressors on benthic and hyporheic nitrate uptake (https://www.ufz.de/index.php?de=20939&pub_id=28875)
Biogeochemistry **167** (3), 287 - 299
10.1007/s10533-024-01130-6 (<https://doi.org/10.1007/s10533-024-01130-6>)
- Phillips, E., Picott, K., **Kümmel, S.**, Bulka, O., Edwards, E., Wang, P.-H., Gehre, M., Nijenhuis, I., Lollar, B.S. (2024):
Vitamin B₁₂ as a source of variability in isotope effects for chloroform biotransformation by *Dehalobacter* (https://www.ufz.de/index.php?de=20939&pub_id=29648)
MicrobiologyOpen **13** (4), e1433
10.1002/mbo3.1433 (<https://doi.org/10.1002/mbo3.1433>)
- Vinyes-Nadal, M., **Kümmel, S.**, Espín, Y., Gómez-Alday, J.J., Gehre, M., Otero, N., Torrentó, C. (2024):
Dual C and Cl compound-specific isotope analysis and metagenomic insights into the degradation of the pesticide methoxychlor (https://www.ufz.de/index.php?de=20939&pub_id=29741)
J. Hazard. Mater. **480** , art. 135929
10.1016/j.jhazmat.2024.135929 (<https://doi.org/10.1016/j.jhazmat.2024.135929>)

- Vinyes-Nadal, M., Masbou, J., **Kümmel, S.**, Gehre, M., Imfeld, G., Otero, N., Torrentó, C. (2024): Novel extraction methods and compound-specific isotope analysis of methoxychlor in environmental water and aquifer slurry samples (https://www.ufz.de/index.php?de=20939&pub_id=29213) *Sci. Total Environ.* **931**, art. 172858
10.1016/j.scitotenv.2024.172858 (<https://doi.org/10.1016/j.scitotenv.2024.172858>)
- Wang, T., Planer-Friedrich, B., **Kümmel, S.**, Muehe, E.M. (2024): Climatic conditions impact As and Cd mobility differently in flooded paddy soils (https://www.ufz.de/index.php?de=20939&pub_id=32119)
EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024
EGUsphere
Copernicus Publications, EGU24-16246
10.5194/egusphere-egu24-16246 (<https://doi.org/10.5194/egusphere-egu24-16246>)
- Xiang, Q., Stryhanyuk, H., Schmidt, M., **Kümmel, S.**, Richnow, H.H., Zhu, Y.-G., Cui, L., Musat, N. (2024): Stable isotopes and nanoSIMS single-cell imaging reveals soil plastisphere colonizers able to assimilate sulfamethoxazole (https://www.ufz.de/index.php?de=20939&pub_id=28631)
Environ. Pollut. **355**, art. 124197
10.1016/j.envpol.2024.124197 (<https://doi.org/10.1016/j.envpol.2024.124197>)
- Zhang, X., Zheng, Y., Su, Z., Wang, Z., Zhang, J., Jia, Z., **Kümmel, S.**, Qin, C., Liu, Y., Wang, S., Nijenhuis, I., Richnow, H.H. (2024): Anaerobic biotransformation of hexachlorocyclohexane isomers in aqueous condition: dual C-Cl isotope fractionation and impact on microbial community compositions (https://www.ufz.de/index.php?de=20939&pub_id=28842)
Water Res. **254**, art. 121389
10.1016/j.watres.2024.121389 (<https://doi.org/10.1016/j.watres.2024.121389>)
- Zhu, M., Liu, Y., He, Y., **Kuemmeel, S.**, Wu, L., Shen, D., Richnow, H.H. (2024): Multi-element (^2H , ^{13}C , ^{37}Cl) isotope analysis to characterize reductive transformation of α -, β -, γ -, and δ -HCH isomers by cobalamin and Fe^0 nanoparticles (https://www.ufz.de/index.php?de=20939&pub_id=29674)
J. Hazard. Mater. **480**, art. 135932
10.1016/j.jhazmat.2024.135932 (<https://doi.org/10.1016/j.jhazmat.2024.135932>)

➔ zum Inhalt

2023 (9)

- Bredum, S.K., Strathe, A.V., Jacobsen, J., Christoffersen, B.Ø., Gehre, M., **Kümmel, S.**, Junghans, P., Marcussen, C. (2023): Quantifying energy expenditure in Göttingen Minipigs with the ^{13}C -bicarbonate method under basal and drug-treated conditions (https://www.ufz.de/index.php?de=20939&pub_id=28382)
Clin. Nutr. ESPEN **58**, 388 - 396
10.1016/j.clnesp.2023.10.041 (<https://doi.org/10.1016/j.clnesp.2023.10.041>)
- Davoudpour, Y., **Kümmel, S.**, Musat, N., Richnow, H.H., Schmidt, M. (2023): Tracking deuterium uptake in hydroponically grown maize roots using correlative helium ion microscopy and Raman micro-spectroscopy (https://www.ufz.de/index.php?de=20939&pub_id=27238)
Plant Methods **19**, art. 71
10.1186/s13007-023-01040-y (<https://doi.org/10.1186/s13007-023-01040-y>)
- Hellmold, N., Eberwein, M., Phan, M.H.T., **Kümmel, S.**, Einsle, O., Deobald, D., Adrian, L. (2023): *Dehalococcoides mccartyi* strain CBDB1 takes up protons from the cytoplasm to reductively dehalogenate

organohalides indicating a new modus of proton motive force generation (https://www.ufz.de/index.php?de=20939&pub_id=28457)

Front. Microbiol. **14**, art. 1305108

10.3389/fmicb.2023.1305108 (<https://doi.org/10.3389/fmicb.2023.1305108>)

- Liu, X., **Kümmel, S.**, Trapp, S., Richnow, H.H. (2023):
Uptake and transformation of hexachlorocyclohexane isomers (HCHs) in tree growth rings at a contaminated field site (https://www.ufz.de/index.php?de=20939&pub_id=27043)
Environ. Sci. Technol. **57** (23), 8776 - 8784
10.1021/acs.est.3c01929 (<https://doi.org/10.1021/acs.est.3c01929>)
- Liu, X., Wu, L., **Kümmel, S.**, Gehre, M., Richnow, H.H. (2023):
Determination of stable hydrogen isotopic composition and isotope enrichment factor at low hydrogen concentration (https://www.ufz.de/index.php?de=20939&pub_id=28308)
Anal. Chem. **95** (44), 16272 - 16278
10.1021/acs.analchem.3c03214 (<https://doi.org/10.1021/acs.analchem.3c03214>)
- Min, N., Yao, J., Li, H., Chen, Z., Pang, W., Zhu, J., **Kümmel, S.**, Schaefer, T., Herrmann, H., Richnow, H.H. (2023):
Humic substance photosensitized degradation of phthalate characterized by ^2H and ^{13}C isotope fractionation (https://www.ufz.de/index.php?de=20939&pub_id=25394)
Environ. Sci. Technol. **57** (5), 1930 - 1939
10.1021/acs.est.2c06783 (<https://doi.org/10.1021/acs.est.2c06783>)
- Min, N., Yao, J., Li, H., Zhu, J., **Kümmel, S.**, Schaefer, T., Herrmann, H., Richnow, H.H. (2023):
Carbon isotope fractionation of di-(2-ethylhexyl)-phthalate during photosensitized degradation by $\bullet\text{OH}$ and $\text{SO}_4^{\bullet-}$ for characterization of reaction mechanisms (https://www.ufz.de/index.php?de=20939&pub_id=27937)
Chem. Eng. J. **475**, art. 145950
10.1016/j.cej.2023.145950 (<https://doi.org/10.1016/j.cej.2023.145950>)
- Min, N., Yao, J., Zhu, J., **Kümmel, S.**, Lechtenfeld, O.J., Schaefer, T., Herrmann, H., Richnow, H.H. (2023):
Carbon and hydrogen isotope fractionation of phthalates during photocatalysis reactions in aqueous solution containing Fe(III) complexes or iron minerals (https://www.ufz.de/index.php?de=20939&pub_id=28087)
Water Res. **247**, art. 120740
10.1016/j.watres.2023.120740 (<https://doi.org/10.1016/j.watres.2023.120740>)
- Ouyang, W.-Y., **Kümmel, S.**, Adrian, L., Zhu, Y.-G., Richnow, H.H. (2023):
Carbon and hydrogen stable isotope fractionation of sulfamethoxazole during anaerobic transformation catalyzed by *Desulfovibrio vulgaris* Hildenborough (https://www.ufz.de/index.php?de=20939&pub_id=26773)
Chemosphere **311**, Part 2, art. 136923
10.1016/j.chemosphere.2022.136923 (<https://doi.org/10.1016/j.chemosphere.2022.136923>)

➔ zum Inhalt

2022 (7)

- Buchner, D., Martin, P.R., Scheckenbach, J., **Kümmel, S.**, Gelman, F., Haderlein, S.B. (2022):
Expanding the calibration range of compound-specific chlorine isotope analysis by the preparation of a ^{37}Cl -enriched tetrachloroethylene (https://www.ufz.de/index.php?de=20939&pub_id=26547)

Rapid Commun. Mass Spectrom. **36** (21), e9378
10.1002/rcm.9378 (<https://doi.org/10.1002/rcm.9378>)

- Liu, X., Wu, L., **Kümmel, S.**, Richnow, H.H. (2022):
Stable isotope fractionation associated with the synthesis of hexachlorocyclohexane isomers for characterizing sources (https://www.ufz.de/index.php?de=20939&pub_id=25768)
Chemosphere **296**, art. 133938
10.1016/j.chemosphere.2022.133938 (<https://doi.org/10.1016/j.chemosphere.2022.133938>)
- Liu, X., Yang, A., **Kümmel, S.**, Richnow, H.H. (2022):
Uptake and metabolization of HCH isomers in trees examined over an annual growth period by compound-specific isotope analysis and enantiomer fractionation (https://www.ufz.de/index.php?de=20939&pub_id=26283)
Environ. Sci. Technol. **56** (14), 10120 - 10130
10.1021/acs.est.2c02697 (<https://doi.org/10.1021/acs.est.2c02697>)
- Liu, Y., Fu, J., Wu, L., **Kümmel, S.**, Nijenhuis, I., Richnow, H.H. (2022):
Characterization of hexachlorocyclohexane isomer dehydrochlorination by LinA1 and LinA2 using multi-element compound-specific stable isotope analysis (https://www.ufz.de/index.php?de=20939&pub_id=26889)
Environ. Sci. Technol. **56** (23), 16848 - 16856
10.1021/acs.est.2c05334 (<https://doi.org/10.1021/acs.est.2c05334>)
- Malina, N., **Kümmel, S.**, Richnow, H.H., Vogt, C. (2022):
Analysis of carbon and hydrogen stable isotope ratios of phenolic compounds: method development and biodegradation applications (https://www.ufz.de/index.php?de=20939&pub_id=25474)
ACS ES&T Water **2** (1), 32 - 39
10.1021/acsestwater.1c00218 (<https://doi.org/10.1021/acsestwater.1c00218>)
- Phillips, E., Bulka, O., Picott, K., **Kümmel, S.**, Edwards, E., Nijenhuis, I., Gehre, M., Dworatzek, S., Webb, J., Sherwood Lollar, B. (2022):
Investigation of active site amino acid influence on carbon and chlorine isotope fractionation during reductive dechlorination (https://www.ufz.de/index.php?de=20939&pub_id=26285)
FEMS Microbiol. Ecol. **98** (8), fiac072
10.1093/femsec/fiac072 (<https://doi.org/10.1093/femsec/fiac072>)
- Tamisier, M., Schmidt, M., Vogt, C., **Kümmel, S.**, Stryhanyuk, H., Musat, N., Richnow, H.-H., Musat, F. (2022):
Iron corrosion by methanogenic archaea characterized by stable isotope effects and crust mineralogy (https://www.ufz.de/index.php?de=20939&pub_id=24779)
Environ. Microbiol. **24** (2), 583 - 595
10.1111/1462-2920.15658 (<https://doi.org/10.1111/1462-2920.15658>)

➔ zum Inhalt

2021 (5)

- Gilevska, T., Sullivan Ojeda, A., **Kuemmell, S.**, Gehre, M., Seger, E., West, K., Morgan, S.A., Mack, E.E., Sherwood Lollar, B. (2021):
Multi-element isotopic evidence for monochlorobenzene and benzene degradation under anaerobic conditions in contaminated sediments (https://www.ufz.de/index.php?de=20939&pub_id=25304)
Water Res. **207**, art. 117809
10.1016/j.watres.2021.117809 (<https://doi.org/10.1016/j.watres.2021.117809>)

- Liu, X., Bonhomme, J., Merbach, I., **Kümmel, S.**, Richnow, H.H. (2021):
Uptake of α -HCH by wheat from the gas phase and translocation to soil analyzed by a stable carbon isotope labeling experiment (https://www.ufz.de/index.php?de=20939&pub_id=23780)
Chemosphere **264** (Part 2), art. 128489
10.1016/j.chemosphere.2020.128489 (<https://doi.org/10.1016/j.chemosphere.2020.128489>)
- Liu, X., Li, W., **Kümmel, S.**, Merbach, I., Sood, U., Gupta, V., Lal, R., Richnow, H.H. (2021):
Soil from a hexachlorocyclohexane contaminated field site inoculates wheat in a pot experiment to facilitate the microbial transformation of β -hexachlorocyclohexane examined by compound-specific isotope analysis (https://www.ufz.de/index.php?de=20939&pub_id=25336)
Environ. Sci. Technol. **55** (20), 13812 - 13821
10.1021/acs.est.1c03322 (<https://doi.org/10.1021/acs.est.1c03322>)
- Liu, X., Wu, L., **Kümmel, S.**, Richnow, H.H. (2021):
Characterizing the biotransformation of hexachlorocyclohexanes in wheat using compound-specific stable isotope analysis and enantiomer fraction analysis (https://www.ufz.de/index.php?de=20939&pub_id=23791)
J. Hazard. Mater. **406**, art. 124301
10.1016/j.jhazmat.2020.124301 (<https://doi.org/10.1016/j.jhazmat.2020.124301>)
- Wu, L., Suchana, S., Flick, R., **Kümmel, S.**, Richnow, H., Passepourt, E. (2021):
Carbon, hydrogen and nitrogen stable isotope fractionation allow characterizing the reaction mechanisms of 1H-benzotriazole aqueous phototransformation (https://www.ufz.de/index.php?de=20939&pub_id=24982)
Water Res. **203**, art. 117519
10.1016/j.watres.2021.117519 (<https://doi.org/10.1016/j.watres.2021.117519>)

➔ zum Inhalt

2020 (7)

- Dalby, F.R., Hansen, M.J., Feilberg, A., **Kümmel, S.**, Nikolausz, M. (2020):
Effect of tannic acid combined with fluoride and lignosulfonic acid on anaerobic digestion in the agricultural waste management chain (https://www.ufz.de/index.php?de=20939&pub_id=22915)
Bioresour. Technol. **307**, art. 123171
10.1016/j.biortech.2020.123171 (<https://doi.org/10.1016/j.biortech.2020.123171>)
- Gilevska, T., Sullivan Ojeda, A., Renpenning, J., **Kümmel, S.**, Gehre, M., Nijenhuis, I. (2020):
Requirements for chromium reactors for use in the determination of H isotopes in compound-specific stable isotope analysis of chlorinated compounds (https://www.ufz.de/index.php?de=20939&pub_id=22747)
Anal. Chem. **92** (3), 2383 - 2387
10.1021/acs.analchem.9b04737 (<https://doi.org/10.1021/acs.analchem.9b04737>)
- Günthel, M., Klawonn, I., Woodhouse, J., Bižić, M., Ionescu, D., Ganzert, L., **Kümmel, S.**, Nijenhuis, I., Zoccarato, L., Grossart, H.-P., Tang, K.W. (2020):
Photosynthesis-driven methane production in oxic lake water as an important contributor to methane emission (https://www.ufz.de/index.php?de=20939&pub_id=23649)
Limnol. Oceanogr. **65** (12), 2853 - 2865
10.1002/lno.11557 (<https://doi.org/10.1002/lno.11557>)
- Klawonn, I., Eichner, M.J., Wilson, S.T., Moradi, N., Thamdrup, B., **Kümmel, S.**, Gehre, M., Khalili, A., Grossart, H.-P., Karl, D.M., Ploug, H. (2020):
Distinct nitrogen cycling and steep chemical gradients in *Trichodesmium* colonies

(https://www.ufz.de/index.php?de=20939&pub_id=22774)

ISME J. **14** (2), 399 - 412

10.1038/s41396-019-0514-9 (<https://doi.org/10.1038/s41396-019-0514-9>)

- **Kümmel, S.**, Horst, A., Gelman, F., Strauss, H., Richnow, H.H., Gehre, M. (2020):
Simultaneous compound-specific analysis of $\delta^{33}\text{S}$ and $\delta^{34}\text{S}$ in organic compounds by GC-MC-ICPMS using medium- and low-mass-resolution modes (https://www.ufz.de/index.php?de=20939&pub_id=24067)
Anal. Chem. **92** (21), 14685 - 14692
10.1021/acs.analchem.0c03253 (<https://doi.org/10.1021/acs.analchem.0c03253>)
- Liu, X., Wu, L., **Kümmel, S.**, Merbach, I., Lal, R., Richnow, H.H. (2020):
Compound-specific isotope analysis and enantiomer fractionation to characterize the transformation of hexachlorocyclohexane isomers in a soil–wheat pot system (https://www.ufz.de/index.php?de=20939&pub_id=23451)
Environ. Sci. Technol. **54** (14), 8690 - 8698
10.1021/acs.est.9b07609 (<https://doi.org/10.1021/acs.est.9b07609>)
- Liu, Y., **Kümmel, S.**, Yao, J., Nijenhuis, I., Richnow, H.-H. (2020):
Dual C–Cl isotope analysis for characterizing the anaerobic transformation of α , β , γ , and δ -hexachlorocyclohexane in contaminated aquifers (https://www.ufz.de/index.php?de=20939&pub_id=23501)
Water Res. **184**, art. 116128
10.1016/j.watres.2020.116128 (<https://doi.org/10.1016/j.watres.2020.116128>)

➔ zum Inhalt

2019 (4)

- Lihl, C., Renpenning, J., **Kümmel, S.**, Gelman, F., Schürner, H.K.V., Daubmeier, M., Heckel, B., Melsbach, A., Bernstein, A., Shouakar-Stash, O., Gehre, M., Elsner, M. (2019):
Toward improved accuracy in chlorine isotope analysis: Synthesis routes for in-house standards and characterization via complementary mass spectrometry methods (https://www.ufz.de/index.php?de=20939&pub_id=22304)
Anal. Chem. **91**, 12290 - 12297
10.1021/acs.analchem.9b02463 (<https://doi.org/10.1021/acs.analchem.9b02463>)
- Löffler, M., **Kümmel, S.**, Vogt, C., Richnow, H.-H. (2019):
 H_2 kinetic isotope fractionation superimposed by equilibrium isotope fractionation during hydrogenase activity of *D. vulgaris* strain Miyazaki (https://www.ufz.de/index.php?de=20939&pub_id=22016)
Front. Microbiol. **10**, art. 1545
10.3389/fmicb.2019.01545 (<https://doi.org/10.3389/fmicb.2019.01545>)
- Torgonskaya, M.L., Zyakun, A.M., Trotsenko, Y.A., Laurinavichius, K.S., **Kümmel, S.**, Vuilleumier, S., Richnow, H.H. (2019):
Individual stages of bacterial dichloromethane degradation mapped by stable carbon and chlorine isotope analysis (https://www.ufz.de/index.php?de=20939&pub_id=21026)
J. Environ. Sci. **78**, 147 - 160
10.1016/j.jes.2018.09.008 (<https://doi.org/10.1016/j.jes.2018.09.008>)
- Winkler, P., Kaiser, K., Jahn, R., Mikutta, R., Fiedler, S., Cerli, C., Kölbl, A., Schulz, S., Jankowska, M., Schlöter, M., Müller-Niggemann, C., Schwark, L., Woche, S.K., **Kümmel, S.**, Utami, S.R., Kalbitz, K. (2019):
Tracing organic carbon and microbial community structure in mineralogically different soils exposed to redox fluctuations (https://www.ufz.de/index.php?de=20939&pub_id=21723)

➔ zum Inhalt

2018 (7)

- Bhattarai, S., Cassarini, C., Rene, E.R., **Kümmel, S.**, Esposito, G., Lens, P.N.L. (2018):
Enrichment of ANME-2 dominated anaerobic methanotrophy from cold seep sediment in an external ultrafiltration membrane bioreactor (https://www.ufz.de/index.php?de=20939&pub_id=20479)
Eng. Life Sci. **18** (6), 368 - 378
10.1002/elsc.201700148 (<https://doi.org/10.1002/elsc.201700148>)
- Chevallier, M.L., Cooper, M., **Kümmel, S.**, Barbance, A., Le Paslier, D., Richnow, H.H., Saaidi, P.-L., Adrian, L. (2018):
Distinct carbon isotope fractionation signatures during biotic and abiotic reductive transformation of chlordecone (https://www.ufz.de/index.php?de=20939&pub_id=20147)
Environ. Sci. Technol. **52** (6), 3615 - 3624
10.1021/acs.est.7b05394 (<https://doi.org/10.1021/acs.est.7b05394>)
- Filippini, M., Nijenhuis, I., **Kümmel, S.**, Chiarini, V., Crosta, G., Richnow, H.H., Gargini, A. (2018):
Multi-element compound specific stable isotope analysis of chlorinated aliphatic contaminants derived from chlorinated pitches (https://www.ufz.de/index.php?de=20939&pub_id=20379)
Sci. Total Environ. **640-641**, 153 - 162
10.1016/j.scitotenv.2018.05.285 (<https://doi.org/10.1016/j.scitotenv.2018.05.285>)
- Franke, S., **Kümmel, S.**, Nijenhuis, I. (2018):
Liquid chromatography/isotope ratio mass spectrometry analysis of halogenated benzoates for characterization of the underlying degradation reaction in *Thauera chlorobenzoica* CB-1^T (https://www.ufz.de/index.php?de=20939&pub_id=20336)
Rapid Commun. Mass Spectrom. **32** (11), 906 - 912
10.1002/rcm.8113 (<https://doi.org/10.1002/rcm.8113>)
- Liu, J., Wu, L., **Kümmel, S.**, Yao, J., Schaefer, T., Herrmann, H., Richnow, H.-H. (2018):
Carbon and hydrogen stable isotope analysis for characterizing the chemical degradation of tributyl phosphate (https://www.ufz.de/index.php?de=20939&pub_id=20781)
Chemosphere **212**, 133 - 142
10.1016/j.chemosphere.2018.08.034 (<https://doi.org/10.1016/j.chemosphere.2018.08.034>)
- Sousa, D.Z., Visser, M., van Gelder, A.H., Boeren, S., Pieterse, M.M., Pinkse, M.W.H., Verhaert, P.D.E.M., Vogt, C., Franke, S., **Kümmel, S.**, Stams, A.J.M. (2018):
The deep-subsurface sulfate reducer *Desulfotomaculum kuznetsovii* employs two methanol-degrading pathways (https://www.ufz.de/index.php?de=20939&pub_id=19865)
Nat. Commun. **9**, art. 239
10.1038/s41467-017-02518-9 (<https://doi.org/10.1038/s41467-017-02518-9>)
- Stryhanyuk, H., Calabrese, F., **Kümmel, S.**, Musat, F., Richnow, H.-H., Musat, N. (2018):
Calculation of single cell assimilation rates from SIP-nanoSIMS-derived isotope ratios: a comprehensive approach (https://www.ufz.de/index.php?de=20939&pub_id=21088)
Front. Microbiol. **9**, art. 2342
10.3389/fmicb.2018.02342 (<https://doi.org/10.3389/fmicb.2018.02342>)

➔ zum Inhalt

2017 (2)

- Gehre, M., Renpenning, J., Geilmann, H., Qi, H., Coplen, T.B., **Kümmel, S.**, Ivdrá, N., Brand, W.A., Schimmelmann, A. (2017):
Optimization of on-line hydrogen stable isotope ratio measurements of halogen- and sulfur-bearing organic compounds using elemental analyzer–chromium/high-temperature conversion isotope ratio mass spectrometry (EA-Cr/HTC-IRMS) (https://www.ufz.de/index.php?de=20939&pub_id=18478)
Rapid Commun. Mass Spectrom. **31** (6), 475 - 484
10.1002/rcm.7810 (<https://doi.org/10.1002/rcm.7810>)
- Wu, L., **Kümmel, S.**, Richnow, H.H. (2017):
Validation of GC–IRMS techniques for $\delta^{13}\text{C}$ and $\delta^2\text{H}$ CSIA of organophosphorus compounds and their potential for studying the mode of hydrolysis in the environment (https://www.ufz.de/index.php?de=20939&pub_id=18413)
Anal. Bioanal. Chem. **409** (10), 2581 - 2590
10.1007/s00216-017-0203-3 (<https://doi.org/10.1007/s00216-017-0203-3>)

➔ zum Inhalt

2016 (2)

- **Kümmel, S.**, Starke, R., Chen, G., Musat, F., Richnow, H.H., Vogt, C. (2016):
Hydrogen isotope fractionation as a tool to identify aerobic and anaerobic PAH biodegradation (https://www.ufz.de/index.php?de=20939&pub_id=17324)
Environ. Sci. Technol. **50** (6), 3091 - 3100
10.1021/acs.est.5b04819 (<https://doi.org/10.1021/acs.est.5b04819>)
- Nijenhuis, I., Renpenning, J., **Kümmel, S.**, Richnow, H.H., Gehre, M. (2016):
Recent advances in multi-element compound-specific stable isotope analysis of organohalides: Achievements, challenges and prospects for assessing environmental sources and transformation (https://www.ufz.de/index.php?de=20939&pub_id=17547)
Trends Environ. Anal. Chem. **11**, 1 - 8
10.1016/j.teac.2016.04.001 (<https://doi.org/10.1016/j.teac.2016.04.001>)

➔ zum Inhalt

2015 (2)

- Hoth, N., Gniese, C., Rakoczy, J., Weber, A., **Kümmel, S.**, Reichel, S., Freese, C., Hache, M., Kassahun, A., Schulz, A., Fischer, H., Mühling, M., Starke, R., Kahnt, R., Vogt, C., Richnow, H.-H., Krüger, M., Schippers, A., Schlömann, M. (2015):
CO₂BioPerm — influence of bio-geochemical CO₂-transformation processes on the long-term permeability (https://www.ufz.de/index.php?de=20939&pub_id=15877)
In: Liebscher, A., Münch, U. (eds.)
Geological Storage of CO₂ – Long Term Security Aspects. GEOTECHNOLOGIEN Science Report No. 22
Advanced Technologies in Earth Sciences
Springer, Berlin, Heidelberg, p. 73 - 96
10.1007/978-3-319-13930-2_4 (https://doi.org/10.1007/978-3-319-13930-2_4)
- **Kümmel, S.**, Herbst, F.-A., Bahr, A., Duarte, M., Pieper, D.H., Jehmlich, N., Seifert, J., von Bergen, M., Bombach, P., Richnow, H.H., Vogt, C. (2015):
Anaerobic naphthalene degradation by sulfate-reducing *Desulfobacteraceae* from various anoxic aquifers (https://www.ufz.de/index.php?de=20939&pub_id=16113)
FEMS Microbiol. Ecol. **91** (3), fiv006
10.1093/femsec/fiv006 (<https://doi.org/10.1093/femsec/fiv006>)

➔ zum Inhalt

2014 (1)

- Morris, B.E.L., Gissibl, A., **Kümmel, S.**, Richnow, H.-H., Boll, M. (2014):
A PCR-based assay for the detection of anaerobic naphthalene degradation
(https://www.ufz.de/index.php?de=20939&pub_id=14888)
FEMS Microbiol. Lett. **354** (1), 55 - 59
10.1111/1574-6968.12429 (<https://doi.org/10.1111/1574-6968.12429>)

➔ zum Inhalt

2013 (1)

- **Kümmel, S.**, Kuntze, K., Vogt, C., Boll, M., Heider, J., Richnow, H.H. (2013):
Evidence for benzylsuccinate synthase subtypes obtained by using stable isotope tools
(https://www.ufz.de/index.php?de=20939&pub_id=14168)
J. Bacteriol. **195** (20), 4660 - 4667
10.1128/JB.00477-13 (<https://doi.org/10.1128/JB.00477-13>)

➔ zum Inhalt