

Nicolaj Mahlstedt

Publication List

Six publications with major impact for the work of GEOS4

Mahlstedt, N., Horsfield, B., Weniger, P., Misch, D., Shi, X., Noah, M. & Boreham, C. (2022) Molecular hydrogen from organic sources in geological systems. *Journal of Natural Gas Science and Engineering*, 105, 104704. <https://doi.org/10.1016/j.jngse.2022.104704>

Han, Y., Horsfield, B., Mahlstedt, N. & Noah, M. (2021) Chemostatistic allocation of shale oil production using acidic heterocompounds. *AAPG Bulletin*, 105,11, 2207–2219. <https://doi.org/10.1306/06102119035>

Mahlstedt, N., Horsfield, B., Karg, H., David, P. & Garlich, T.U. (2019) Vaca Muerta unconventional oil study - Insights from organic geochemistry. *Unconventional Resources Technology Conference (URTeC)*, Denver. <https://doi.org/10.15530/urtec-2019-379>

Mahlstedt, N. & Horsfield, B. (2019) Thermovaporisation: A screening tool for the gas-sorptive properties of source rocks. *Organic Geochemistry*, 131, 1-4. <https://doi.org/10.1016/j.orggeochem.2019.02.006>

Mahlstedt, N., Horsfield, B. & di Primio, R. (2013) GORFit – From Liquids to Late Gas: Deconvoluting Primary from Secondary Gas Generation Kinetics. 26th International Meeting on Organic Geochemistry (IMOG), Tenerife, Canary Islands (Spain). *Book of Abstracts*, p. 193. <https://core.ac.uk/download/pdf/36125784.pdf>

Mahlstedt, N. & Horsfield, B. (2012) Metagenetic methane generation in gas shales I. Screening protocols using immature samples. *Marine and Petroleum Geology*, 31, 1, 27-42. <https://doi.org/10.1016/j.marpetgeo.2011.06.011>

All Publications in the order of publication date

2024

Mahlstedt, N., Horsfield, B. & Boreham, C. (2024) Comment on “The H₂ potential of the Colombian coals in natural conditions” by Moretti et al. [1], *International Journal of Hydrogen Energy* 89, 1492-1494. <https://doi.org/10.1016/j.ijhydene.2024.09.430>

2023

- Boreham, C.J., Edwards, D.S., Feitz, A.J., Murray, A.P., Mahlstedt, N. & Horsfield, B. (2023) Modelling of hydrogen gas generation from overmature organic matter in the Cooper Basin, Australia. *The APPEA Journal*, 63, S351-S356. <https://doi.org/10.1071/AJ22084>
- Han, S., Xie, L., Du, X., Xiang, C., Huang, J., Tang, Z., Wang, C., Horsfield, B. & Mahlstedt, N. (2023) Insights into organic metagenesis using Raman spectroscopy and high-resolution mass spectrometry: A case study of the Shahezi formation, deep Songliao basin, China. *International Journal of Coal Geology*, 265. <https://doi.org/10.1016/j.coal.2022.104153>
- Liu, B., Mahlstedt, N., Horsfield, B., Tian, S., Huo, Q., Wen, Z. & Pan, Z. (2023) Phase behavior and GOR evolution using a natural maturity series of lacustrine oil-prone shale: Implications from compositional modelling. *Organic Geochemistry*, 185, 104675. <https://doi.org/10.1016/j.orggeochem.2023.104675>
- Mahlstedt, N., Horsfield, B., Michael, E., Song, Y., Tobey, M. & Mangelsdorf, K. (2023) Impact of Expulsion and Production Fractionation on Petroleum Composition: Novel Insights from Polar Compounds Geochemistry. 31st International Meeting on Organic Geochemistry (IMOG), Montpellier, France 2023, 1-2. <https://doi.org/10.3997/2214-4609.202333146>

2022

- Franz, G., Lyckberg, P., Khomenko, V., Chournousenko, V., Schulz, H.M., Mahlstedt, N., Wirth, R., Glodny, J., Gernert, U. & Nissen, J. (2022) Fossilization of Precambrian microfossils in the Volyn pegmatite, Ukraine. *Biogeosciences*, 19, 1795–1811, <https://doi.org/10.5194/bg-19-1795-2022>
- Han, S., Tang, Z., Wang, C., Horsfield, B., Wang T. & Mahlstedt, N. (2022) Hydrogen-rich gas discovery in continental scientific drilling project of Songliao Basin, Northeast China: new insights into deep Earth exploration. *Science Bulletin*, 67, 10, 1003-1006. <https://doi.org/10.1016/j.scib.2022.02.008>
- Horsfield, B., Mahlstedt, N., Weniger, P., Misch, D., Vranjes-Wessely, S., Han, S. & Wang, C. (2022) Molecular hydrogen from organic sources in the deep Songliao Basin, P.R. China. *International Journal of Hydrogen Energy*, 47,38, <https://doi.org/10.1016/j.ijhydene.2022.02.208>
- Mahlstedt, N., Horsfield, B., Weniger, P., Misch, D., Shi, X., Noah, M. & Boreham, C. (2022) Molecular hydrogen from organic sources in geological systems. *Journal of Natural Gas Science and Engineering*, 105, 104704. <https://doi.org/10.1016/j.jngse.2022.104704>
- Noah, M., Forsythe, J., di Primio, R., Mehay, S., Mullins, O.C., Mahlstedt, N. & Horsfield, B. (2022) Heavy End Evaluation in Oils and Associated Asphaltene Deposits from Two Adjacent Reservoirs by High-Resolution Mass Spectrometry. *Energy & Fuels*. <https://doi.org/10.1021/acs.energyfuels.2c00913>
- Song, Y., Michael, E., McLin, K., Mahlstedt, N., Horsfield, B., Poetz, S. & Mangelsdorf, K. (2022) Compositional Fractionation of Petroleum Fluids During Migration and Production: A Bakken Case

Study with Fourier Transform Ion Cyclotron Resonance (FT-ICR) Mass Spectrometry. Proceedings of the 10th Unconventional Resources Technology Conference. <https://doi.org/10.15530/urtec-2022-3722153>

2021

Han, Y., Horsfield, B., Mahlstedt, N. & Noah, M. (2021) Chemostatistic allocation of shale oil production using acidic heterocompounds. *AAPG Bulletin*; 105, 11, 2207–2219.
<https://doi.org/10.1306/06102119035>

Han, Y., Horsfield, B., Mahlstedt, N. & LaReau, H. (2021) Bitumen geochemistry and producibility in the Upper Cretaceous Niobrara Formation shale oil play. *AAPG Bulletin*; 105, 10, 2017–2039.
<https://doi.org/10.1306/03122118078>

Horsfield, B., Zou, C., Li, J., Yang, S., Mahlstedt, N., Misch, D., Gross, D., Wei, M., Wang, Y. & Tan, J. (2021) Prediction of the gas-generating characteristics of the Qiongzhusi and Longmaxi Formations, Yangtze Platform, southern China, using analogues. *AAPG Bulletin*, 105, 945–985.
<https://doi.org/10.1306/11182018244>

Mahlstedt, N., Noah, M. & Horsfield, B. (2021) Assessing source rock organofacies using the FT-ICR MS amenable NSO-compounds inventory of pyrolysates. 30th International Meeting on Organic Geochemistry (IMOG), Montpellier, France. <https://doi.org/10.3997/2214-4609.202134248>

Shalaby, M.R., Mahlstedt, N., Oslu, L.N. & Islam, M.A. (2021) PhaseKinetics for assessing the compositional evolution of petroleum generated from the early to Late Miocene source rock, Belait Formation, Brunei-Muara district, Brunei Darussalam. *Journal of Petroleum Science and Engineering*, 206. <https://doi.org/10.1016/j.petrol.2021.108965>

Schulz, H.M., Yang, S., Schovsbo, N.H., Rybacki, E., Ghanizadeh, A., Bernard, S., Mahlstedt, N., Krüger, M., Amann-Hildebrandt, A., Krooss, B.M., Meier T. & Reinicke, A. (2021) The Furongian to Lower Ordovician Alum Shale Formation in conventional and unconventional petroleum systems in the Baltic Basin – A review. *Earth-Science Reviews*, 218.
<https://doi.org/10.1016/j.earscirev.2021.103674>

2020

Froidl, F., Zieger, L., Mahlstedt, N. & Littke, R. (2020) Comparison of single- and multi-ramp bulk kinetics for a natural maturity series of Westphalian coals: Implications for modelling petroleum generation. *International Journal of Coal Geology*, 219.
<https://doi.org/10.1016/j.coal.2019.103378>

- Johnson, L.M., Rezaee, R., Smith, G.C., Mahlstedt, N., Edwards, D.S., Kadkhodaie, A. & Yu, H. (2020) Kinetics of hydrocarbon generation from the marine Ordovician Goldwyer Formation, Canning Basin, Western Australia. *International Journal of Coal Geology*, 232. <https://doi.org/10.1016/j.coal.2020.103623>
- Han, Y., Poetz, S., Mahlstedt, N. & Horsfield, B. (2020) On the release of acidic NSO compounds from the oil-mature Barnett Shale using different solvents. *Journal of Petroleum Science and Engineering*, 185. <https://doi.org/10.1016/j.petrol.2019.106605>
- Hu, S., Song, Y., Su, P., Mahlstedt, N., Mangelsdorf, K., Shen, C., Li, S. & Zhu, K. (2020) Impact of marine incursions on lacustrine source rocks: organic matter quantity, quality, and kinetics in the Paleocene South Yellow Sea Basin, offshore eastern China. *Organic Geochemistry*, 148. <https://doi.org/10.1016/j.orggeochem.2020.104084>

2019

- Han, Y., Horsfield, B., LaReau, H. & Mahlstedt, N. (2019) Intraformational migration of petroleum: Insights into the development of sweet spot in the Cretaceous Niobrara shale-oil system, Denver Basin. *Marine and Petroleum Geology*, 107, 301-309. <https://doi.org/10.1016/j.marpetgeo.2019.05.026>
- Han, Y., Horsfield, B., Mahlstedt, N., Wirth, R., Curry, D.J. & LaReau, H. (2019) Factors controlling source and reservoir characteristics in the Niobrara shale oil system, Denver Basin. *AAPG Bulletin*, 103, 2045-2072. <https://doi.org/10.1306/0121191619717287>
- Horsfield, B., Mahlstedt, N., Michael, E., McMahon & N., Tobey, M. (2019) Production Fractionation and Efficiency Indicators from Phase Snapshots. *Unconventional Resources Technology Conference (URTeC)*, Denver. <https://doi.org/10.15530/urtec-2019-375>
- Mahlstedt, N. & Horsfield, B. (2019) Thermovaporisation: A screening tool for the gas-sorptive properties of source rocks. *Organic Geochemistry*, 131, 1-4. <https://doi.org/10.1016/j.orggeochem.2019.02.006>
- Mahlstedt, N., Horsfield, B., Karg, H., David, P. & Garlichs, T.U. (2019) Vaca Muerta unconventional oil study - Insights from organic geochemistry. *Unconventional Resources Technology Conference (URTeC)*, Denver. <https://doi.org/10.15530/urtec-2019-379>
- Ziegs, V., Poetz, S., Mahlstedt, N., Horsfield, B., Hartwig, A., Rinna, J. & Skeie, J.E. (2019) Using polar NSO compounds to improve our understanding of reservoir geochemistry - A case study from Valhall, Norway. *29th International Meeting on Organic Geochemistry, IMOG 2019*. <https://www.earthdoc.org/content/papers/10.3997/2214-4609.201902787>

2018

- Han, Y., Horsfield, B., Mahlstedt, N., LaReau, H. & Curry, D. J. (2018) Compositional fractionation of petroleum from reservoir to wellhead in the Niobrara shale oil play. *International Journal of Coal Geology*, 198, 156-166. <https://doi.org/10.1016/j.coal.2018.09.006>
- Han, Y., Poetz, S., Mahlstedt, N., Karger, C. & Horsfield, B. (2018) Fractionation and origin of NyOx and Ox compounds in the Barnett Shale sequence of the Marathon 1 Mesquite well, Texas. *Marine and Petroleum Geology*, 97, 517-524. <https://doi.org/10.1016/j.marpetgeo.2018.07.031>
- Han, Y., Pötz, S., Mahlstedt, N., Karger, C. & Horsfield, B. (2018) Fractionation of pyrrolic nitrogen-containing compounds during primary migration of petroleum within the Barnett Shale sequence of Marathon 1 Mesquite Well, Texas. *Energy & Fuels*. <https://doi.org/10.1021/acs.energyfuels.7b03488>
- Horsfield, B., Schulz, H., Bernard, S., Mahlstedt, N., Han, Y. & Kuske, S. (2018) Oil and Gas Shales. - In: Wilkes, H. (Ed.), *Hydrocarbons, Oils and Lipids: Diversity, Origin, Chemistry and Fate*, (Handbook of Hydrocarbon and Lipid Microbiology), Springer, 1-34. https://doi.org/10.1007/978-3-319-90569-3_18
- Mahlstedt, N. (2018) Thermogenic Formation of Hydrocarbons in Sedimentary Basins. - In: Wilkes, H. (Ed.), *Hydrocarbons, Oils and Lipids: Diversity, Origin, Chemistry and Fate*, (Handbook of Hydrocarbon and Lipid Microbiology), Springer International Publishing, 1-30. https://doi.org/10.1007/978-3-319-54529-5_15-1

2017

- Han, Y., Horsfield, B., Wirth, R., Mahlstedt, N. & Bernard, S. (2017) Oil retention and porosity evolution in organic-rich shales. *AAPG Bulletin*, 101, 6, 807-827. <https://doi.org/10.1306/09221616069>
- Ma, Y., Cao, T., Snowdon, L., Qian, M., Jiang, Q., Li, M., Mahlstedt, N. & Horsfield, B. (2017) Impact of Different Experimental Heating Rates on Calculated Hydrocarbon Generation Kinetics. *Energy & Fuels*. <https://doi.org/10.1021/acs.energyfuels.7b01035>

2016

- Abbassi, S., Edwards, D.S., George, S.C., Volk, H., Mahlstedt, N., di Primio, R. & Horsfield, B. (2016) Petroleum potential and kinetic models for hydrocarbon generation from the Upper Cretaceous to Paleogene Latrobe Group coals and shales in the Gippsland Basin, Australia. *Organic Geochemistry* 91, 54-67. <http://dx.doi.org/10.1016/j.orggeochem.2015.11.001>
- Mahlstedt, N., Horsfield, B., Wilkes, H. & Poetz, S. (2016) Tracing the Impact of Fluid Retention on Bulk Petroleum Properties Using Nitrogen-Containing Compounds. *Energy and Fuels*, 30, 8, 6290-6305. <https://doi.org/10.1021/acs.energyfuels.6b00994>

Misch, D., Gross, D., Mahlstedt, N., Makogon, V. & Sachsenhofer, R.F. (2016) Shale gas/shale oil potential of Upper Viséan Black Shales in the Dniepr-Donets Basin (Ukraine). *Marine and Petroleum Geology*, 75, 203-219. <http://dx.doi.org/10.1016/j.marpetgeo.2016.04.017>

Yang, S., Horsfield, B., Mahlstedt, N., Stephenson, M. & Könitzer, S. (2016) On the primary and secondary petroleum generating characteristics of the Bowland Shale, northern England. *Journal of the Geological Society*, 173, 2, 292-305. <https://doi.org/10.1144/jgs2015-056>

2015

Han, Y., Mahlstedt, N. & Horsfield, B. (2015) The Barnett Shale: Compositional fractionation associated with intraformational petroleum migration, retention, and expulsion. *AAPG Bulletin*, 99, 12, 2173-2202. <https://doi.org/10.1306/06231514113>

Mahlstedt, N., di Primio, R., Horsfield, B. & Boreham, C.J. (2015) Multi-component kinetics and late gas potential of selected Cooper Basin source rocks. *Record 2015/19*. *Geoscience Australia*, Canberra. <http://dx.doi.org/10.11636/Record.2015.019>

Tan, J., Horsfield, B., Mahlstedt, N., Zhang, J., Boreham, C.J. Hippler, D., van Graas, G. & Tocher, B.A. (2015) Natural gas potential of Neoproterozoic and lower Palaeozoic marine shales in the Upper Yangtze Platform, South China: geological and organic geochemical characterization. *International Geology Review*, 2015, 1-22. <https://doi.org/10.1080/00206814.2015.1004200>

2014

Franz, G., Hippler, D., Rhede, D., Wirth, R., Banerjee, D.M. & Mahlstedt, N. (2014) Diagenetic formation of interlayer-deficient fluorophlogopite as a clay mineral in Early Cambrian phosphorite (Lesser Himalaya, India): The trioctahedral analogue of illite. *American Mineralogist*, 99, 11-12, 2353-2368. <http://dx.doi.org/10.2138/am-2014-4852>

Han, S., Horsfield, B., Zhang, J., Chen, Q., Mahlstedt, N., di Primio, R. & Xiao, G. (2014) Hydrocarbon Generation Kinetics of Lacustrine Yanchang Shale in Southeast Ordos Basin, North China. *Energy & Fuels*, 28, 5632-5639. <https://doi.org/10.1021/ef501011b>

Mahlstedt, N., Hübner, A., di Primio, R. & Horsfield, B. (2014) Think molecular it translates into pay! *GeoExPro*, 11, 2, 74-78. https://www.researchgate.net/publication/261161089_Think_molecular

Ziegs, V., Mahlstedt, N., Bruns, B. & Horsfield, B. (2014) Predicted bulk composition of petroleum generated by Lower Cretaceous Wealden black shales, Lower Saxony Basin, Germany. *International Journal of Earth Sciences*, 1-17. <http://link.springer.com/article/10.1007/s00531-014-1081-y>

2013 and earlier

- Mahlstedt, N., Horsfield, B. & di Primio, R. (2013) GORFit – From Liquids to Late Gas: Deconvoluting Primary from Secondary Gas Generation Kinetics, 26th International Meeting on Organic Geochemistry (IMOG), Tenerife, Canary Islands (Spain). Book of Abstracts, p. 193.
<https://core.ac.uk/download/pdf/36125784.pdf>
- Rippen, D., Littke, R., Bruns, B. & Mahlstedt, N. (2013) Organic geochemistry and petrography of Lower Cretaceous Wealden black shales of the Lower Saxony Basin: The transition from lacustrine oil shales to gas shales. *Organic Geochemistry*, 63, 18-36.
<https://doi.org/10.1016/j.orggeochem.2013.07.013>
- Tan, J., Horsfield, B., Mahlstedt, N., Zhang, J., di Primio, R., Vu, T.T.A., Boreham, C.J., van Graas, G. & Tocher, B.A. (2013) Physical properties of petroleum formed during maturation of Lower Cambrian shale in the upper Yangtze Platform, South China, as inferred from PhaseKinetics modelling. *Marine and Petroleum Geology*, 48, 47-56.
<https://doi.org/10.1016/j.marpetgeo.2013.07.013>
- Vu, T.T.A., Horsfield, B., Mahlstedt, N., Schenk, H.J., Kelemen, S. R., Walters, C.C., Kwiatek, P.J. & Sykes, R. (2013) The structural evolution of organic matter during maturation of coals and its impact on petroleum potential and feedstock for the deep biosphere. *Organic Geochemistry*, 62, 17-27.
<https://doi.org/10.1016/j.orggeochem.2013.06.011>
- Mahlstedt, N. (2012) Evaluating the late gas potential of source rocks stemming from different sedimentary environments. Ph.D. Thesis. TU Berlin. <https://doi.org/10.14279/DEPOSITONCE-3395>
- Mahlstedt, N. & Horsfield, B. (2012) Metagenetic methane generation in gas shales I. Screening protocols using immature samples. *Marine and Petroleum Geology*, 31, 1, 27-42.
<https://doi.org/10.1016/j.marpetgeo.2011.06.011>
- Mahlstedt, N. & Horsfield, B. (2011) Gas Generation at High Maturities (> Ro = 2%) in Gas Shales. Adapted from oral presentation at AAPG International Conference and Exhibition. Milan, Italy.
http://www.searchanddiscovery.com/documents/2012/40873mahlstedt/ndx_mahlstedt.pdf
- Mahlstedt, N., Horsfield, B. & Dieckmann, V. (2008) Second order reactions as a prelude to gas generation at high maturity. *Organic Geochemistry*, 39, 8, 1125-1129.
<https://doi.org/10.1016/j.orggeochem.2008.04.011>