

Peer-reviewed publications (* designates papers as PI/senior author¹)

- [53] Perevalova, A.A., Bidzhieva, S.K., Kublanov, I.V., **Hinrichs, K.-U.**, Liu, X.L., Mardanov, A.V., Lebedinsky, A.V., Bonch-Osmolovskaya, E.A. (2010) *Fervidococcus fontis* gen. nov., sp. nov., a novel anaerobic thermophilic crenarchaeote from hot springs in Kamchatka, and proposal of *Fervidococcaceae* fam. nov. and *Fervidococcales* ord. nov. *International Journal of Systematic and Evolutionary Microbiology*, in press, doi:10.1099/ij.s.0.019042-0.
- [52] Borin S., Ventura S., Tambone F., Mapelli F., Schubotz F., Brusetti L., Scaglia B., D'Acqui L., Solheim B., Turicchia S., Marasco, R., **Hinrichs K.-U.**, Baldi F., Adani F., Daffonchio, D. (2010) Rock weathering creates oases of life in a High Arctic desert, *Environmental Microbiology*, in press, doi:10.1111/j.1462-2920.2009.02059.x.
- [51] Pape T., Bahr A., Rethemeyer J., Kessler J.D., Sahling H., **Hinrichs K.-U.**, Klapp S.A., Reeburgh W.S., Bohrmann G. (2010) Molecular and isotopic partitioning of low-molecular weight hydrocarbons during migration and gas hydrate precipitation in deposits of a high-flux seepage site. *Chemical Geology*, 269, 350-363.
- [50] Schmidt, F., **Hinrichs, K.-U.**, Elvert, M. Sources, transport, and partitioning of organic matter at a highly dynamic continental margin. (2010) *Marine Chemistry*, 118, 37-55.
- *[49] Heuer, V.B., Krüger, M., Elvert, M., **Hinrichs, K.-U.** (2010) Experimental studies on the stable carbon isotope biogeochemistry of acetate in lake sediments. *Organic Geochemistry*, 41, 22-30.
- [48] Bradley, A.S., Fredricks, H.F., **Hinrichs, K.-U.**, Summons, R.E. (2009) Structural diversity of diether lipids in carbonate chimneys at the Lost City Hydrothermal Field, *Organic Geochemistry*, 40, 1169-1178.
- *[47] Lipp, J.S., **Hinrichs, K.-U.** (2009) Structural diversity and fate of intact polar lipids in marine sediments, *Geochimica et Cosmochimica Acta*, 73, 6816-6833.
- *[46] Sepúlveda, J.C., Wendler, J., Summons, R.E., **Hinrichs, K.-U.** (2009) Rapid resurgence of marine productivity after the Cretaceous-Paleogene mass extinction, *Science*, 326, 129-132.
- *[45] Schubotz, F., Wakeham, S.G., Lipp, J.S., Fredricks, H.F., **Hinrichs, K.-U.** (2009) Detection of microbial biomass by intact membrane lipid analysis in the water column and surface sediments of the Black Sea, *Environmental Microbiology*, 11, 2720-2734.
- [44] Bühring, S.I., Smittenberg, R.H., Sachse, D., Lipp, J.S., Golubic, S., Sachs, J.P., **Hinrichs, K.-U.**, Summons, R.E. (2009) A hypersaline microbial mat from the Pacific Atoll Kiritimati: Insight into composition and carbon fixation using biomarker analyses and a ¹³C-labeling approach. *Geobiology*, 7, 308-323.
- *[43] Schmidt, F., Elvert, M., Koch, B., Witt, M., **Hinrichs, K.-U.** (2009) Molecular characterization of dissolved organic matter in pore water in continental shelf sediments. *Geochimica et Cosmochimica Acta*, 73, 3337-3358.
- *[42] Heuer, V.B., Pohlman, J.W., Torres, M.E., Elvert, M., **Hinrichs, K.-U.** (2009) The stable carbon isotope biogeochemistry of acetate and other dissolved carbon species in deep sub-seafloor sediments at the northern Cascadia Margin. *Geochimica et Cosmochimica Acta*, 73, 3323-3336.
- *[41] Sepúlveda, J., Wendler, J., Leider, A., Kuss, H.-J., Summons, R.E., **Hinrichs, K.-U.** (2009) Molecular-isotopic evidence of environmental and ecological changes across the Cenomanian-Turonian boundary in the Levant Platform of central Jordan. *Organic Geochemistry*, 40, 553-568.
- [40] Joye, S.B., Samarkin, V.A., Orcutt, B.N., MacDonald, I.R., **Hinrichs, K.-U.**, Elvert, M., Teske, A.P., Lloyd K.G., Montoya, J.P., Meile, C.D. (2009) Metabolic variability in seafloor brines revealed by carbon and sulphur dynamics. *Nature Geosciences*, 2, 349-354.
- [39] De Deckker, P., Abed, R.M.M., De Beer, D., **Hinrichs, K.-U.**, O'Loingsigh, T., Schefuss, E., Stuut, J.B., Tapper, N.J., van der Kaars, S. (2008) Geochemical and microbiological fingerprinting of airborne dust that fell in Canberra, Australia, in October 2002, *Geochemistry, Geophysics, Geosystems*, 9, Q12Q10, doi:10.1029/2008GC002091.
- *[38] Ertefai, T.F., Fisher, M.C., Fredricks, H.F., Lipp, J.S., Birgel, D., Udert, K.M., Cavanaugh, C.M., Pearson, A., Gschwend, P.M., **Hinrichs, K.-U.** (2008). Vertical distribution of microbial lipids and functional genes in

- chemically distinct layers of a highly polluted meromictic lake. *Organic Geochemistry*, 39, 1572-1588, <http://dx.doi.org/10.1016/j.orggeochem.2008.07.009>.
- *[37] Lipp, J.S., Morono, Y., Inagaki, F., **Hinrichs, K.-U.** (2008). Significant contribution of Archaea to extant biomass in marine subsurface sediments. *Nature*, 454, 991-994, <http://dx.doi.org/10.1038/nature07174>.
- [36] Meckler, A.N., Schubert, C.J., Hochuli, P.A., Plessen, B., Birgel, D., **Hinrichs, K.-U.**, Haug, G.H. (2008) Terrigenous organic matter input to sediments from Orca Basin, Gulf of Mexico - a combined optical and biomarker approach. *Earth and Planetary Science Letters*, 272, 251-263, <http://dx.doi.org/10.1016/j.epsl.2008.04.046>.
- [35] Stadnitskaia, A., Bouloubassi, I., Elvert, M., **Hinrichs, K.-U.**, Sinninghe Damsté, J.S. (2008) Extended hydroxyarchaeol, a novel biomarker for anaerobic methanotrophy in cold seepage habitats. *Organic Geochemistry*, 39, 1007-1014, <http://dx.doi.org/10.1016/j.orggeochem.2008.04.019>.
- [34] Wegener, G., Niemann, H., Elvert, M., **Hinrichs, K.-U.**, Boetius, A. (2008) Assimilation of Methane and Inorganic Carbon by Microbial Communities Mediating the Anaerobic Oxidation of Methane. *Environmental Microbiology*, 10, 2287-2298, <http://dx.doi.org/10.1111/j.1462-2920.2008.01653.x>.
- *[33] Rossel, P.E., Lipp, J.S., Fredricks, H.F., Arnds, J., Boetius, A., Elvert, M., **Hinrichs, K.-U.** (2008) Intact polar lipids of anaerobic methanotrophic archaea and associated bacteria. *Organic Geochemistry*, 39, 992-999, <http://dx.doi.org/10.1016/j.orggeochem.2008.02.021>.
- [32] Strapoc, D., Picardal, F.W., Turich, C., Schaperdoth, I., Macalady, J.L., Lipp J.S., Lin, Y.-S., Ertel, T.F., Schubotz, F., **Hinrichs, K.-U.**, Mastalerz, M., Schimmelmann, A. (2008) Methane-Producing Microbial Community in a Coal Bed of the Illinois Basin. *Applied and Environmental Microbiology*, 74, 2424-2432.
- [31] Elshahed, M.S., Youssef, N.H., Luo, Q., Najar, F.Z., Roe, B.A., Sisk, T.M., Bühring, S.I., **Hinrichs, K.-U.**, Krumholz, L.R. (2007) Phylogenetic and Metabolic Diversity of *Planctomycetes* from Anaerobic, Sulfide- and Sulfur-Rich Zodletone Spring, Oklahoma. *Applied and Environmental Microbiology*, 73, 4707-4716.
- *[30] Fredricks, H.F., **Hinrichs, K.-U.** (2007) Data report: Intact membrane lipids as indicators of subsurface life in Cretaceous and Paleogene sediments from Sites 1257 and 1258. *Proceedings of the Ocean Drilling Program, Scientific Results* Vol. 207, <http://dx.doi.org/10.2973/odp.proc.sr.207.112.2007>.
- *[29] Heuer V., Elvert M., Tille S., Krummen M., Prieto Mollar X., Hmelo L.R., **Hinrichs K.-U.** (2006) Online $\delta^{13}\text{C}$ analysis of volatile fatty acids in sediment/porewater systems by liquid chromatography-isotope ratio-mass spectrometry. *Limnology and Oceanography-Methods*, 4, 346-357.
- [28] Birgel, D., Thiel, V., **Hinrichs, K.-U.**, Elvert, M., Campbell, K., Reitner, J., Farmer, J.D., Peckmann, J., (2006) Lipid biomarker patterns of methane-seep microbialites from the Mesozoic convergent margin of California, *Organic Geochemistry*, 37, 1289-1302.
- *[27] **Hinrichs, K.-U.**, Hayes, J.M., Bach, W., Spivack, A., Hmelo, L.R., Holm, N., Johnson, C.G., Sylva, S.P. (2006) Biological formation of ethane and propane in the deep marine subsurface. *Proceedings of the National Academy of Sciences, U.S.A.*, 103, 14684-14689.
- [26] Spivack, A., McNeill, C., Holm, N.G., and **Hinrichs, K.-U.** (2006) The determination of in situ methane based on the analysis of void gas. *Proceedings of the Ocean Drilling Program, Scientific Results*, Vol. 201, Ms 201SR-119, http://www-odp.tamu.edu/publications/201_SR/119/119.htm.
- [25] Bice, K., Birgel, D., Meyers, P.A., Dahl, K.A., **Hinrichs, K.-U.**, Norris, R.D. (2006) A multiple proxy and modeling study of Cretaceous upper ocean temperatures and atmospheric CO₂ concentrations from tropical Atlantic foraminifera and organic matter. *Paleoceanography*, 21, PA2002, doi:10.1029/2005PA001203.
- *[24] Biddle, J.F., Lipp, J.S., Lever, M., Lloyd, K., Sørensen, K., Anderson, R., Fredricks, H.F., Elvert, M., Kelly, T.J., Schrag, D.P., Sogin, M.L., Brenchley, J.E., Teske, A., House, C.H., **Hinrichs, K.-U.** (2006) Heterotrophic Archaea dominate sedimentary subsurface ecosystems off Peru. *Proceedings of the National Academy of Sciences, U.S.A.*, 103, 3846-3851.
- *[23] Sturt, H.F., Summons, R.E., Smith, K.J., Elvert, M., and **Hinrichs, K.-U.** (2004) Intact polar membrane lipids in prokaryotes and sediments deciphered by ESI-HPLC-MSⁿ – new biomarkers for biogeochemistry and microbial ecology. *Rapid Communications in Mass Spectrometry*, 18, 617-628.

- [22] Orphan, V.J., Ussler, W. III, Nähr, T., House, C.H., **Hinrichs, K.-U.**, and Paull, C. K. (2004) Geological, geochemical, and microbiological heterogeneity of the seafloor around methane vents in the Eel River Basin, offshore California. *Chemical Geology*, **205**, 265-289.
- [21] D'Hondt, S., Jørgensen, B.B., Miller, D.J., Batzke, A., Blake, R., Cragg, B.A., Cypionka, H., Dickens, G.R., Ferdelman, T., **Hinrichs, K.-U.**, Holm, N.G., Mitterer, R., Spivack, A., Wang, G., Bekins, B., Engelen, B., Ford, K., Gettemy, G., Rutherford, S.D., Sass, H., Skilbeck, C.G., Aiello, I.W., Guèrin, G., House, C., Inagaki, F., Meister, P., Nähr, T., Niitsuma, S., Parkes, R.J., Schippers, A., Smith, D.C., Teske, A., Wiegand, J., Padilla, C.N., and Solis Acosta, J.L. (2004) Distributions of metabolic activities in deep seafloor sediments. *Science*, **306**, 2216-2221.
- *[20] **Hinrichs K.-U.**, Hmelo L.R., and Sylva, S.P. (2003) Molecular fossil record of elevated methane levels in late Pleistocene coastal waters, *Science*, **299**, 1214-1217.
- [19] Orphan, V.J., House, C.H., **Hinrichs, K.-U.**, McKeegan, K.D., & DeLong, E.F. (2002) Multiple archaeal groups mediate methane oxidation in anoxic cold seep sediments. *Proceedings of the National Academy of Sciences, U.S.A.* **99**, 7663-7668.
- *[18] **Hinrichs, K.-U.** (2002) Microbial fixation of methane-carbon at 2.7 Ga: was an anaerobic mechanism possible? *Geochemistry, Geophysics, Geosystems*, **3**, doi:10.1029/2001GC000286.
- [17] Teske, A., **Hinrichs, K.-U.**, Edgcomb, V., de Vera Gomez, A., Kysela, D., Sylva, S.P., Sogin, M.L., & Jannasch, H.W. (2002) Microbial diversity of hydrothermal sediments in the Guaymas Basin: evidence for anaerobic methanotrophic communities. *Applied and Environmental Microbiology*, **68**, 1994-2007.
- [16] **Hinrichs, K.-U.** and Boetius, A. (2002) The anaerobic oxidation of methane: New insights in microbial ecology and biogeochemistry. *Ocean Margin Systems* (eds. G. Wefer *et al.*), Springer Verlag, Berlin-Heidelberg, pp. 457-477.
- [15] Orphan, V.J., House, C.H., **Hinrichs, K.-U.**, McKeegan, K.D., & DeLong, E.F. (2001) Methane-consuming archaea revealed by directly coupled isotopic and phylogenetic analysis. *Science*, **293**, 484-487.
- [14] Orphan, V.J., **Hinrichs, K.-U.**, Paull, C.K., Taylor, L.T., Sylva, S.P., & DeLong, E.F. (2001) Comparative analysis of methane-oxidizing archaea and sulfate-reducing bacteria in anoxic marine sediments. *Applied and Environmental Microbiology*, **67**, 1922-1934.
- [13] Jahnke, L.L., Eder, W., Huber, R., Hope, J.M., Stetter, K.O., **Hinrichs, K.-U.**, Hayes, J.M., Des Marais, D.J., Cady, S., Summons, R.E. (2001) Signature lipids and stable carbon isotope analyses of Octopus Spring hyperthermophilic communities compared with those of *Aquificales* representatives. *Applied and Environmental Microbiology*, **67**, 5179-5189.
- *[12] **Hinrichs, K.-U.**, Eglinton, G., Engel, M.H., & Summons, R.E. (2001) Exploiting the multivariate isotopic nature of organic compounds. *Geochemistry, Geophysics, Geosystems*, **2**, doi:10.1029/2001GC000142.
- *[11] **Hinrichs, K.-U.** (2001) A molecular recorder of methane hydrate destabilization. *Geochemistry, Geophysics, Geosystems*, **2**, doi:10.1029/2000GC000118.
- [10] Bian, L.Q., **Hinrichs, K.-U.**, Xie, T.M., Brassell, S.C., Beck, J.P., Iversen, N., Fossing, H., Jørgensen, B.B., & Hayes, J.M. (2001) Algal and archaeal isoprenoids in a Recent marine sediment: molecular-isotopic evidence for anaerobic oxidation of methane. *Geochemistry, Geophysics, Geosystems*, **2**, doi:10.1029/2000GC000112.
- [9] **Hinrichs, K.-U.**, Summons, R.E., Orphan, V., Sylva, S.P., & Hayes, J.M. (2000) Molecular and isotopic analyses of anaerobic methane-oxidizing communities in marine sediments. *Organic Geochemistry*, **31**, 1685-1701.
- [8] **Hinrichs, K.-U.**, Pancost, R.D., Summons, R.E., Sprott, G.D., Sylva, S.P., Sinninghe Damsté, J.S., & Hayes, J.M. (2000) Mass spectra of *sn*-2-hydroxyarchaeol, a polar-lipid biomarker for anaerobic methanotrophy. *Geochemistry, Geophysics, Geosystems*, **1**, 2000GC000042.
- [7] Bolle, M.-P., Pardo, A., **Hinrichs, K.-U.**, Adatte, T., Salis, K.V., Burns, S., Keller, G. & Muzylev, N. (2000) The Paleocene-Eocene transition in the marginal northeastern Tethys (Kazakhstan and Uzbekistan) - a multidisciplinary approach. *International Journal of Earth Sciences*, **89**, 390-414.

- [6] **Hinrichs, K.-U.**, Schneider, R.R., Müller, P.J., and Rullkötter, J. (1999) A biomarker perspective on paleoproductivity variations in two Late Quaternary sediment sections from the Southeast Atlantic Ocean. *Organic Geochemistry*, **30**, 341-366.
- [5] **Hinrichs, K.-U.**, Hayes, J.M., Sylva, S.P., Brewer, P.G., and DeLong, E.F. (1999) Methane-consuming archaeobacteria in marine sediments. *Nature*, **398**, 802-805.
- [4] **Hinrichs, K.-U.**, and Rullkötter, J. (1997) Terrigenous and marine lipids in Amazon Fan sediments - implications for sedimentological reconstructions. In: *Proc. ODP, Sci. Res.*, **155** (Eds. R.D. Flood, D.J.W. Piper, A. Klaus & L.C. Peterson), 539-553. Ocean Drilling Program, College Station, TX.
- [3] **Hinrichs, K.-U.**, Rinna, J., Rullkötter, J., and Stein, R. (1997) A 160 kyr record of alkenone-derived sea-surface temperatures from Santa Barbara Basin sediments. *Naturwissenschaften*, **84**, 126-128.
- [2] Budzinski, H., Garrigues, P., Bernard, G., Bellocq, J., **Hinrichs, K.-U.**, and Rullkötter, J. (1997) Identification of polycyclic aromatic hydrocarbons in sediments from the Amazon Fan: Occurrence and diagenetic evolution. In: *Proc. ODP, Sci. Res.*, **155** (Eds. R.D. Flood, D.J.W. Piper, A. Klaus & L.C. Peterson), 555-564. Ocean Drilling Program, College Station, TX.
- [1] **Hinrichs, K.-U.**, Rullkötter, J., and Stein, R. (1995) Preliminary assessment of organic geochemical signals in sediments from Hole 893A, Santa Barbara Basin, offshore California. In: *Proc. ODP, Sci. Res.*, **146**, Pt. 2 (Ed. by J.P. Kennett, J. Baldauf & M. Lyle), pp. 201-211. Ocean Drilling Program, College Station, TX.

Selected manuscripts in progress (*PI/senior author)

In press, not yet accessible online

- [56] Kinnaman, F.S., Kimball, J., Busso, L., Birgel, D., Ding, H., **Hinrichs, K.-U.**, Valentine, D.L. Gas flux and carbonate occurrence at a shallow seep of thermogenic natural gas. (2010) *Geo-Marine Letters*, in press (accepted Jan 8, 2010).
- *[55] Lin, Y.-S., Biddle, J.F., Lipp, J.S., Orcutt, B., Holler, T., Teske, A., **Hinrichs, K.-U.** (2010) Effect of storage conditions on archaeal and bacterial communities in subsurface marine sediments, *Geomicrobiology Journal*, in press (accepted Oct 01, 2009).
- [54] Lever, M.A., Heuer, V.B., Morono, Y., Masui, N., Schmidt, F., Alperin, M.J., Inagaki, F., **Hinrichs, K.-U.**, Teske, A. (2010) Acetogenesis in deep subseafloor sediment of the Juan de Fuca Ridge flank: a synthesis of geochemical, thermodynamic, and gene-based evidence. *Geomicrobiology Journal*, in press (accepted Aug 14, 2009).

In review

- * Ertefai, T.F., Heuer, V.B., Prieto Mollar, X., Vogt, C., Sylva, S.P., Seewald, J., Hinrichs, K.-U. The biogeochemistry of sorbed methane in marine sediments, *Geochimica et Cosmochimica Acta*, in revision.
- * Bühring, S.I., Sievert, S.M., Jonkers, H.M., Ertefai, T., Elshahed, M.S., Krumholz, L.R., Hinrichs, K.-U. Insights into chemotaxonomic composition and carbon cycling of phototrophic communities in an artesian sulfur-rich spring of moderate temperature (Zodletone, Oklahoma, USA), a possible analogue for ancient microbial mat systems, *Geobiology*, in review.
- * Bühring, S.I., Schubotz, F., Harms, C., Lipp, J.S., Amils, R., Hinrichs, K.-U. Lipid signatures of acidophilic microbial communities in an extreme, acidic environment: Río Tinto, Spain, *Applied and Environmental Microbiology*, in review.
- * Liu, X.L., Leider, A., Gillespie, A., Gröger, J., Versteegh, G., Hinrichs, K.-U. Identification of polar lipid precursors of the ubiquitous branched GDGT orphan lipids in a peat bog in Northern Germany, *Organic Geochemistry*, in review.
- * Lin, Y.S., Heuer, V.B., Ferdelman, T., Hinrichs, K.-U. Microbial formation of methylated sulfides in the anoxic sediment of Lake Plußsee, Germany. *Applied and Environmental Microbiology*, in review.

PhD Dissertation

Hinrichs, K.-U. (1997) Ausgewählte Lipide in Sedimenten des Santa Barbara-Beckens und des Amazonas-Fächers: Zeugnis spätquartärer Paläoumweltbedingungen. PhD Dissertation (Edition Wissenschaft, Reihe Chemie, **106**, Tectum Verlag, Marburg, Germany).

Technical reports

D'Hondt, S., Jørgensen, B.B., Miller, J. & ODP Leg 201 Shipboard Scientific Party. (2003) Proc. ODP, Init. Res. **201**, online: http://www-odp.tamu.edu/publications/201_IR/201ir.htm.

Dickens, G.R., Schroeder, D., **Hinrichs, K.-U.** & ODP Leg 201 Shipboard Scientific Party. (2003) The pressure core sampler (PCS) on Ocean Drilling Program Leg 201: General operations and gas release. Proc. ODP, Init. Res. 201, online: http://www-odp.tamu.edu/publications/201_IR/VOLUME/CHAPTERS/IR201_03.PDF.

Boetius, A., Jørgensen, B.B., Amann, R., **Hinrichs, K.-U.**, Lochte, K., MacGregor, B., & Voordouw, G. (2002) Microbial systems in sedimentary environments of continental margins. *Ocean Margin Systems* (Eds. G. Wefer *et al.*), Springer Verlag, Berlin-Heidelberg, 479-495.

Rinna, J., Günter, U., **Hinrichs, K.-U.**, Mangelsdorf, K., van der Smissen, J.H., & Rullkötter, J. (2000) Temperature-related molecular proxies: Degree of alkenone unsaturation and average chain length of *n*-alkanes. In: *Proceedings of the Sixteenth Annual Pacific Climate (PACLIM) Workshop, May 24-27, 1999, Interagency Ecological Program, Technical Report 65* (Eds. G.J. West & V. L. Buffaloe), 133-140. California Department of Water Resources, Sacramento, CA.

Hinrichs, K.-U., Rinna, J. & Rullkötter, J. (1998) Late Quaternary paleoenvironmental conditions indicated by marine and terrestrial molecular biomarkers in sediments from the Santa Barbara Basin. In: *Proceedings of the Fourteenth Annual Pacific Climate (PACLIM) Workshop, April 6-9, 1997, Interagency Ecological Program, Technical Report 57* (Eds. R. C. Wilson & V. L. Tharp), 125-133. California Department of Water Resources, Sacramento, CA.

Hinrichs, K.-U., Rinna, J., and Rullkötter, J. (1995) Sterol compositions in sediments of the Santa Barbara Basin, California: Assessment of their potential for paleoenvironmental reconstructions. In *Organic Geochemistry: Developments and Applications to Energy, Climate, Environment and Human History*. (Eds. J. O. Grimalt & C. Dorronsoro), pp. 244-246. A.I.G.O.A., San Sebastian, Spain.

Flood, R., Piper, D.J.W., Klaus, A. & Shipboard Scientific Party. (1995) *Proc. ODP. Init. Repts.* **155**. Ocean Drilling Program, College Station, TX.

Commentaries, editorial material

Hinrichs, K.-U. (2009) Fossile Biomoleküle als Zeugen der Vergangenheit. Book review: *Echoes of Life*, S.M. Gaines, G. Eglinton, J. Rullkötter, Oxford University Press, 2008. *Nachrichten aus der Chemie*, **57**, 1029-1030.