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**Personal data**

Date of Birth: 31.10.1963  
 Place of Birth: Erlangen (Germany)

**Education**

1983 Abitur, Oldenburg i.O. (Germany)  
 1983 Civil service at "Deutsches Rotes Kreuz Jeverland" (paramedic)  
 1986 Intermediate diploma in Mineralogy  
 1989 Diploma in Mineralogy ("sehr gut")  
 1993 Dissertation („summa cum laude“)  
 1998 Professorial dissertation (Habilitation) for Mineralogy

**Career History**

Since 2009 Member of University Centre of Applied Geoscience Styria (UZAG)  
 2005-2013 Advisory committee of the Austrian Mineralogical Association (ÖMG)  
 Since 2004 Representative of the Austrian Mineralogical Society for the  
 International Commission on Mineral Growth and Interface Processes  
 (CMGIP).  
 Since 2004 Head of Institute (since 2010 biannual)  
 Since 2001 Professor for Mineralogy at the Institute of Applied Geosciences  
 at the Graz University of Technology, Austria.  
 1999 - 2001 Lecturer (C2) at the Geochemical Institute  
 1993 - 1999 Junior lecturer (C1) at the Geochemical Institute, University Göttingen.  
 "Water-Rock-Interaction, fractionation of stable isotopes  
 and trace elements, weathering of silicates and oxides, marine  
 evaporates."  
 1990 – 1993 Employment at the Henkel GmbH (Düsseldorf). Financial support  
 by BMFT. "Conditioning of drinking water in water supply systems"  
 1989 - 1990 Researcher at the Institute of Sedimentary Petrography  
 (Göttingen). Financial support by the DFG. „Formation  
 of sulphide deposits"  
 1987 Placement at Preussag AG, petroleum and natural gas  
 research laboratory in Berghöpen (Hannover). "Optimization of  
 crude oil extraction"

## Overall Research Interests

Research interests are focussed on solid-liquid interaction as well as the mechanisms and kinetics of neo-formation and dissolution of solids. This comprises experimental studies as well as investigations in natural systems. The topics are devoted to fundamental research with special regard to environmental or applied aspects. Fields of research and teaching activities are mineralogy, hydrogeochemistry, chemical sedimentology, geochemical modelling, applied mineralogy with focus on distribution of trace elements and stable isotopes, solid-liquid interaction, soil chemistry, (paleo)environmental research, formation and stability of colloids and silica polymers, and marine evaporates.

## Publications

Schön, W., Mittermayr, F., Leis, A., Mischak, I., Dietzel, M. (2016) Temporal and spatial variability of chemical and isotopic composition of soil solutions from cambisols in Styria (Austria) - field study and experiments. *Science of the Total Environment* (in press).

Van Zuilen, K., Müller, T., Nägler, T.F., Dietzel, M., Küsters, T. (2016) Experimental determination of barium isotope fractionation during diffusion and adsorption processes at low temperatures. *Geochim Cosmochim Acta* 186, 226-241.

Gussone, N., Dietzel, M. (2016) Calcium Isotope Fractionation during Mineral Precipitation from Aqueous Solution (Chapter III), in: Hoefs, J. (Ed.), *Calcium Stable Isotope Geochemistry, Advances in Isotope Geochemistry*. Springer Heidelberg, 75 - 110.

Mavromatis, V., van Zuilen, K., Purgstaller, B., Baldermann, A., Naegler, T.F., Dietzel, M. (2016) Barium isotope fractionation during witherite (BaCO<sub>3</sub>) dissolution, precipitation and at equilibrium. *Geochim. Cosmochim. Acta* 190, 72-84.

Riechelmann, S., Mavromatis, V., Buhl, D., Dietzel, M., Eisenhauer, A., Immenhauser, A. (2016) Impact of diagenetic alteration on brachiopod calcite magnesium isotope ( $\delta^{26}\text{Mg}$ ) signatures: Experiment versus field data. *Chem. Geol.* 440, 191-206.

Fruchter, N., Eisenhauer, A., Dietzel, M., Fietzke, J., Böhm, F., Montagna, P., Stein, M., Lazar, B., Rodolfo-Metalpa, R., Erez, J. (2016)  $^{88}\text{Sr}/^{86}\text{Sr}$  fractionation in inorganic aragonite and in corals. *Geochimica et Cosmochimica Acta* 178, 268-280.

M. Dietzel, Schön, F., Heinrichs, J., Deditius, A.P., Leis, A. (2016) Tracing formation and durability of calcite in a Punic-Roman cistern mortar (Pantelleria Island, Italy). *Isotopes in Health Study* 52, 112-127

Purgstaller, B., Mavromatis, V., Immenhauser, A., Dietzel, M. (2016) Transformation of Mg bearing amorphous calcium carbonate to Mg-calcite - In situ monitoring. *Geochim. Cosmochim. Acta* 174, 180-195.

Boch, R., Dietzel, M., Reichl, P., Leis, A., Baldermann, A., Mittermayr, F., Pöhl, P. (2015) Rapid ikaite (CaCO<sub>3</sub> · 6H<sub>2</sub>O) crystallization in a man-made river bed: Hydrogeochemical monitoring of a rarely documented mineral formation. *Applied Geochemistry* 63, 366-379.

Grengg, C., F. Mittermayr, A. Baldermann, M.E. Böttcher, A. Leis, G. Koraimanne, P. Grunert, M. Dietzel (2015) Microbiologically induced concrete corrosion: A case study from a combined sewer network. *Cement Concrete Research* 77, 16-25

Baldermann, A., Deditius, A., Dietzel, M., Fichtner, V., Fischer, C., Hippler, D., Leis, A., Baldermann, C., Mavromatis, V., Stickler, C., Strauss, H. (2015) The role of bacterial sulfate

reduction during dolomite precipitation: Implications from Upper Jurassic platform carbonates. *Chem. Geol.* 412. 1-14

M. Oelze, F. v. Blanckenburg, J. Bouchez, D. Hoellen, M. Dietzel, (2015) The effect of Al on Si isotope fractionation investigated by silica precipitation experiments. *Chem. Geol.* 393–394, 112-124.

Geske, A.; Lockier, S.; Dietzel, M.; Richter, D.; Buhl, D.; Immenhauser, A.: Magnesium isotope composition of sabkha porewater and related (Sub-) Recent stoichiometric dolomites, Abu Dhabi (UAE) . - in: *Chemical geology* 394-395 (2015) , S. 112 – 124

M. Oelze, F. v. Blanckenburg, D. Hoellen, M. Dietzel, J. Bouchez (2014) Si stable isotope fractionation during adsorption and the competition between kinetic and equilibrium isotope fractionation: Implications for weathering systems. *Chem. Geol.* 380, 161-171

P. Onuk, Dietzel, M., Hauzenberger, Ch.A. (2014) Formation of helictite in the cave Dragon Belly (Sardinia, Italy)—Microstructure and incorporation of Mg, Sr, and Ba *Chemie der Erde – Geochemistry*, 74 (3), 443-452.

A. Baldermann, R. Dohrmann, S. Kaufhold, C. Nickel, I. Letofsky-Papst, M. Dietzel (2014) The Fe-Mg-saponite solid solution series – A hydrothermal synthesis study. *Clay Minerals* 49 (3), 391-415.

J. Tang, M. Dietzel, A. Fernandez, A. K. Tripathi, B. E. Rosenheim (2014) Evaluation of kinetic effects on clumped isotope fractionation ( $\Delta_{47}$ ) during inorganic calcite precipitation. *Geochim. et Cosmochim. Acta* 134. 120-136.

M. Dietzel, A. Leis, R. Abdalla, J. Savarino, M. Böttcher, S. J. Köhler (2014)  $^{17}\text{O}$  excess traces atmospheric nitrate in paleo-groundwater of the Saharan desert. *Biogeosciences*, 11(12), 3149-3161.

F. Mittermayr, Baldermann, A., Klammer, D., Leis, A., Tritthart, J., Dietzel, M. (2013) Sulfate attack - Reaction mechanisms revealed by a multi proxy approach. *Civil and Environmental Research* 5, 96-100.

A. Baldermann, Warr, L.N., Grathoff, G.H. and Dietzel, M. (2013) The rate and mechanism of deep sea glauconite formation at the Ivory Coast-Ghana Marginal Ridge. *Clays and Clay Minerals* 61 (3), 258-276.

R. Jugdaohsingh, Brown, A., Dietzel, M., and Powell J.J. (2013) High-Aluminum-Affinity Silicate is a Nano-Particle that seeds Secondary Aluminosilicate Formation. *PLOS ONE* 8 (12), e84397.

M. Dietzel., Burgstaller, B., Leis, A., Reichl, P., Stadler, H., Niedermayr, A., Rinder, T., Wagner, H. (2013) Current challenges for scaling of tunnel drainage systems – Modelling approaches, monitoring tools and preventions strategies. *Geomechanics and Tunneling* 6, 743-753.

Mittermayr, F., Baldermann, A., Kurta, C, Rinder, T., Klammer, D., Leis, A., Tritthart, J., Dietzel, M. (2013) Evaporation - a key mechanism for the thaumasite form of sulfate attack. *Cement and Concrete Research*, 49, 55-64

T. Rinder, M. Dietzel, A. Leis (2013) Calcium carbonate scaling under alkaline conditions - Case studies and hydrochemical modelling *Appl. Geochem.* 35, 132-141.

A. Niedermayr, S.J. Köhler and M.Dietzel (2013) Impacts of aqueous carbonate accumulation rate, magnesium and polyaspartic acid on calcium carbonate formation (6 - 40°C) *Chem. Geol.* 340, 105-120.

D. Höllen, D. Klammer, I. Letofsky-Papst and M. Dietzel (2012) Hydrothermal Alteration of Diatomite for Removal of Aqueous  $\text{Cu}^{2+}$ ,  $\text{Pb}^{2+}$  and  $\text{Zn}^{2+}$ . *Journal of Materials Science and Engineering A & B* 10, 523-533.

- Mittermayr, F., D. Klammer, D. Höllen, M. Dietzel, C. Kurta, A. Leis, and M.E. Böttcher (2012) Concrete damage in underground structures. In *Concrete Repair, Rehabilitation and Retrofitting III* (Eds.: M.G. Alexander, et al.) 580-584. **ISBN:** 978-041589952-9
- F. Böhm, Eisenhauer, A., Tang, J., Dietzel, M., Krabbenhöft, A., Kisakürek, B., and Horn, C. (2012) Strontium isotope fractionation of planktic foraminifera and inorganic calcite. *Geochimica et Cosmochimica Acta* 93, 300-314.
- T. Geisler, Perdikouri, C., Kasiopas, A., and Dietzel, M. (2012) Real-time monitoring of the overall exchange of oxygen isotopes between aqueous and H<sub>2</sub>O by Raman spectroscopy. *Geochimica et Cosmochimica Acta* 90, 1-11.
- J. Tang, Niedermayr, A., Köhler, S.J., Böhm, F., Kisakürek, B., Eisenhauer, A., and Dietzel, M. (2012) Sr<sup>2+</sup>/Ca<sup>2+</sup> and <sup>44</sup>Ca/<sup>40</sup>Ca fractionation during inorganic calcite formation: III. Impact of salinity/ionic strength. *Geochimica et Cosmochimica Acta* 77, 432-443.
- F. Mittermayr, Rinder T., Klammer, D., Leis A., and Dietzel, M. (2012) A carbon isotope study of thaumasite and calcite sinter formation in underground constructions.. *Int. Con. Det. Con. C6-1*, 1-14
- F. Mittermayr, C. Bauer, D. Klammer, M. E. Böttcher, A. Leis, P. Escher, and M. Dietzel (2012) Concrete under Sulphate Attack: An Isotope Study on Sulphur Sources. *Isotopes in Environmental and Health Studies* 48 (1) 105-117
- F. Mittermayr, D. Klammer, D. Höllen, S. Köhler, M. Böttcher, A. Leis, M. Dietzel (2011) Deterioration of concrete – Application of stable isotopes (Ed.: M. A. Broekmans) *Proc. Int. Con. Appl. Min.* 435-443
- T. Alemayehu, A. Leis, A. Eisenhauer and M. Dietzel (2011) Multi-proxy approach (<sup>2</sup>H/H, <sup>18</sup>O/<sup>16</sup>O, <sup>13</sup>C/<sup>12</sup>C and <sup>87</sup>Sr/<sup>86</sup>Sr) for evolution of carbonate-rich groundwater in a basalt dominated aquifer, northern Ethiopia. *Geochemistry* 71 (2) 177-187
- D. Klammer and M. Dietzel (2011) Weathering of natural minerals and rocks - Effect of composition and structure of solids and solution chemistry (Eds.: C.Pina, E.Portela, J.Gomes). *Contr. Int. Conf. Dam Eng.* 6, 661-670
- M. Dietzel (2011) Carbonates. *Encyclopedia of Geobiology* (eds: J. Reitner, V. Thiel), Part 3, Springer Verlag, 261-266.
- M. Dietzel, Mittermayr, F., Klammer, D., Höllen, D., Köhler, S., M., Leis, A. (2011) What do stable isotopes and trace elements tell us about deterioration of concrete? *Int. Con. Chem. Cem.* 13(274) 1-6
- F. Mittermayr, Klammer, D., Köhler, S., Leis, A., Höllen, D., Dietzel, M. (2011) Dissolution of dolomite in alkaline cementitious media. *Int. Con. Chem. Cem.* 13(278) 1-6
- M.E., Böttcher and Dietzel, M. (2011) Metal-ion partitioning during low-temperature precipitation and dissolution of anhydrous carbonates and sulfates. In: *Ion partitioning in low temperature aqueous systems* (Eds.: Prieto M., Stoll H.). 10, 139 - 187. doi:10.1180/EMU-notes.10.4.
- A. Immenhauser, D. Buhl, D. Richter, A. Niedermayr, D. Riechelmann, M. Dietzel, U. Schulte (2010) Magnesium-isotope fractionation during low-Mg calcite precipitation in a limestone cave – field study and experiments. *Geochim. et Cosmochim. Acta* 75 (15), 4346-4364.
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- J. Tang, S.-J. Köhler, and M. Dietzel (2008) Sr<sup>2+</sup>/Ca<sup>2+</sup> and <sup>44</sup>Ca/<sup>40</sup>Ca fractionation during inorganic calcite formation: I. Sr incorporation. *Geochim. Cosmochim. Acta.* 72, 3718-3732
- J. Tang, M. Dietzel, S.-J. Köhler, F. Böhm, and A. Eisenhauer (2008) Sr<sup>2+</sup>/Ca<sup>2+</sup> and <sup>44</sup>Ca/<sup>40</sup>Ca fractionation during inorganic calcite formation: II. Ca isotopes. *Geochim. Cosmochim. Acta.* 72, 3733-3745
- M. Dietzel, T. Rinder, A. Niedermayr, F. Mittermayr, A. Leis, D. Klammer, S. Köhler, and P. Reichl (2008) Ursachen und Mechanismen der Versinterung von Tunnelrainagen. *Berg- Huett. M.* 10, 369-372
- M. Dietzel, T. Rinder, A. Leis, P. Reichl, P. Sellner, C. Draschitz, G. Plank, D. Klammer, and H. Schöfer (2008) Koralm tunnel as a case study for sinter formation in drainage systems - precipitation mechanisms and retaliatory action. *Geomech. Tunnelb.* 1(4) 271-278.
- B. Kosednar-Legenstein, M. Dietzel, A. Leis, M. Baumgartner, and K. Stingl (2008) <sup>13</sup>C/<sup>12</sup>C- and <sup>18</sup>O/<sup>16</sup>O-Signatures of Historical Carbonate Mortar and Plaster - Field Study and Experiment. *Appl. Geochem.* 23, 2425-2437
- M. Dietzel, CH. Draschitz, G. Harer, D. Klammer, S. Köhler, A. Leis, F. Mittermayr, A. Niedermayr, P. Reichl, T. Rinder, and P. Sellner (2008) Versinterungen von Tunnelrainagen – Ursachen, Risikoabschätzung, Gegenmaßnahmen. *Knet Waterpool NK4*, 18-25
- H. Wonisch, F. Gérard, M. Dietzel, J. Jaffrain, S. J. Köhler, O. Nestroy, and J.-P. Boudot (2008) Occurrence of polymerized silicic acid and aluminum species in two forest soil solutions with different acidity. *Geoderma* 144, 435-445.
- M. Dietzel, H. Kolmer, P. Pölt and S. Simic (2008) Desert varnish and petroglyphs on sandstone – Geochemical composition and climate changes from Pleistocene to Holocene (Libya) *Geochemistry* 68, 31-43.
- Mittermayr, F., Klammer, D., Dietzel, M., Bauer, C. Böttcher, M., Koch, M., Köhler, S., Mayer, A. and Leis, A. (2008) Thaumazitbildungen in Tunnelbauten - Hydrogeochemie und stabile Isotope. - in: *Geotechnik* 34, S. 115 – 132.
- M. Dietzel, Rinder, T., Niedermayr, A., Köhler, S. und Leis, A. (2008) Versinterungen in Drainagesystemen von Tunnelbauten - Mechanismen, Monitoring und Prognosen. *Geotechnik* 34, S. 89 – 100.

- B. Kosednar-Legenstein and M. Dietzel (2007) Beredter Mörtel. *Spektrum der Wissenschaft* 9, 22-24.
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- M. Dietzel, N. Gussone and A. Eisenhauer (2004) Co-precipitation of Sr<sup>2+</sup> and Ba<sup>2+</sup> with aragonite by membrane diffusion of CO<sub>2</sub> between 10° to 50°C. *Chem. Geol.* 203 (1-2) 139-151.  
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M. Dietzel, E. Usdowski and J. Hoefs (1992) Chemical and  $^{13}\text{C}/^{12}\text{C}$ - and  $^{18}\text{O}/^{16}\text{O}$ -isotope evolution of alkaline drainage waters and the precipitation of calcite. *Applied Geochim.* 7, 177-184

### **Textbooks and Theses**

O. Nestroy and M. Dietzel (2012) Die Dauerausstellung von Bodenprofilen am Institut für Angewandte Geowissenschaften der Technischen Universität Graz. (Ed.: M. Dietzel) *Geotechnik* (44), 67pp.

M. Bucca (2009): Coupled Carbonates Dissolution and Precipitation - Application of aragonitic shells for aqueous removal in synthetic and real wastewaters (Eds.: M. Dietzel et al.) *Geotechnik* (36), 148pp.

M. Dietzel, W. Schubert, H.F. Schweiger, S. Semprich (2008): Drainagesysteme im Tunnelbau: Design, Versinterung und Instandhaltung. *Geotechnik* (34), 172pp.

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E. Usdowski and M. Dietzel (1998) Atlas and Data of Solid-Solution Equilibria of Marine Evaporites. Springer, Berlin Heidelberg New York, 132Fig., 316pp.

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M. Dietzel (1993) Depolymerisation von hochpolymerer Kieselsäure in wässriger Lösung. Dissertation, Universität Göttingen, Germany, 93p

M. Dietzel (1989) Hydrogeochemische und isotopengeochemische Untersuchungen am Leinebuschtunnel zur Erfassung der Kontaminationen des Bergwassers an der Tunnelwandung und zur Erklärung der Abscheidungen im Drainagesystem. Diplomarbeit. Universität Göttingen, 96p