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Event Calendar

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Date	Type	Event	Location
Oct 2021 24-27	IGA Congress	World Geothermal Congress 2020+1	Reykjavik, Iceland
Oct 2021 26	DGMK Event	Workshop: SKETCHNOTING Subsurface Energy	Virtual
Oct 2021 27-29	Enerchange Event	Praxisforum Geothermie Bayern (hybrid event)	Pullach, Germany
Nov 2021 02-03	SPE Workshop on Digital	Transform & Thrive in Turbulent Times	Vienna, Austria
Nov 2021 03-05	SPE Congress	Student Technical Congress 2021	Virtual
Nov 2021 06-13	SPE Congress	SPE Young Professional Congress	Virtual
Nov 2021 16-17	SPE Workshop	Hydrogen's Role in Fuelling the Energy Transition	Virtual
Nov 2021 18	DGMK	Autumn event of the DGMK district group Upper Rhine	Virtual
Nov 2021 18-19	DGMK	Autumn Conference: Implementation of the energy transition - wish and reality	Vienna, Austria
Nov 2021 23-24	SPE Conference	SPE Eastern Europe Subsurface Conference	Kyiv, Ukraine
Nov 2021 23-25	EAGE Event	GET 2021: Geoscience & Engineering in Energy Transition Conference	Strasbourg, France
Nov 2021 30-02	Bundesverband Geothermie	Der Geothermie Kongress 2021	Essen, Germany
Dec 2021 01-03	SPE Workshop	Bridging the Gap Between Geothermal and Oil & Gas	Virtual
Feb 2022 01-04	SPE Confetence	SPE Offshore Europe	Aberdeen, UK

KRAFTVOLL

Maßgeschneidert für den Einsatz bei Geothermieprojekten: **Tiefbohranlagen von Herrenknecht.**

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German Section SPE Chairman Letter

Stefan Wessling, GSSPE Chair & Baker Hughes

Dear members,

Time flies! We already left ¾ of 2021 behind and, with a steady pace, our society comes back to a new equilibrium state, balancing health measures and social activities. Its implementation is not perfect, but it gives us hope for the upcoming year. The challenge is not over yet, so keep vigilant and observe the health norms of your respective city, region, and country; however, let us also take the time together to embrace the new possibilities ahead.

After almost two years, we got the chance to mingle in a modest, but still meaningful, "Sommerfest" reunion to catch up, share stories and enjoy some drinks among colleagues and friends. It was great to see how something we considered usual some months ago, like sitting together in a restaurant, could feel like a month highlight!

In October last year, our perspectives were not so clear and even grim. And it was thanks to our incredible spirit of scientific collaboration, ingenuity, and technology that we could be at this point today. I hope to see in the future the same level of urgency to facilitate the energy transition and our members and industry will play a key role here, front and center, providing expertise and known solutions to other industries that are in their infancy.

As it is usual, our issue collects interesting contributions from you and would summarize some of them. Our young professionals kept very active during the period, and you will find two interesting pieces about our section participation on GeoKalsruhe and the Ambassador Lecture Program featuring our very own Kerstin Kogler. Our student chapters do not lag either. I would like to congratulate Konrad Behnke for his award-winning article on high field strength elements and an insight on microscopic fluid inclusions. If you have comments or annotations to his paper, please reach out to him to share your thoughts.

There also is a short but concise article about the AAPG and SPE merger talks that is worth reading. I would encourage you to be vocal and participate in the talks and other instances of the merger intentions. This will shape our organization for the years to come, whether it happens or not. Don't take for granted what we have and consider that this is the time to raise your concerns or bring your support before a decision point is reached. Closing the issue, our usual contribution from Valentin Goldberg scouting for interesting notes on the European geothermal scene. To expand a little more on this field, we expanded the list of events to include relevant congresses and conferences that will take place in Q4-2021.

In general, signs of improvements for our industry are in the horizon. Just to name a few facts that could talk about this trend, the count of international oil rigs is catching up, landing in almost 1450 by end-September; far away from the numbers we saw in 2019 but still 20% above the count at the beginning of the year. Prices of oil and associated liquids have also been on the rise, with the Brent benchmark is the solid USD 70/barrel guaranteeing healthy margins to have a strong quarter close. Let's not forget that the transformation of our industry and its business model is here, and we need to learn to see with different eyes these indicators. The intention is to keep offering reliable and affordable energy to we keep on working on a better generation mix that will help us handle climate change for good. Let's use this energy for the better!

If I have learned something during this year is that synergies and collaboration are key to success. Whether developing a vaccine or rethinking the way we generate energy, these challenges will require that we get together and "science" our way out of it.

Enjoy this edition and let's keep together!

Sincerely yours,

Stefan Wessling

We are back - Socializing 1.0

Stefan Wesslisng & Sven Haberer, GSSPE Board

After more than a year, the German Section SPE organized its first live event to continue one of our core objectives of networking and socializing among members with shared interests. The event replaced the traditional summer BBQ, which was previously conducted in the Spieker of OneSubsea, and had to be paused due to the Corona pandemic.

15 SPE members from different companies / institutions met in the Bavarian Paulaner restaurant in Hannover to mingle and exchange their experience – professional and personal, with hearty food and beverages. 3G Corona regulations were active and checked by the restaurant to minimize infection risks.

The evening was accompanied by a lot of laughing, many stories and good exchange of what happened during the past year, and most importantly about the relevance of such life events. One highlight to mention was the handing over of the Regional Formation Evaluation Award to our colleague Andreas Hartmann – congrats to this prestigious award which is well deserved!

After this initial success, the German Section plans to organize more events, one of them on November 6th following the Students Technical Congress.

So, watch out your emails for further announcements, this is really an exciting and fantastic opportunity to meet your colleagues and friends again after such a long time. Looking forward to see y'all soon!

Sven & Stefan

SPE and AAPG plan to merge – your voice matters

Ingo Forstner , Bundesverband Erdgas, Erdöl und Geoenergie e.V.

AAPG and SPE Explore Merger to Create New Organization.

The combination of the two would create the energy professionals' organization of the future.

AAPG and SPE announce intentions to merge and create a new organization. Dedicated website about the merger. Available here.

Lately, the leadership of SPE International and AAPG (founded 1917 as the American Association of Petroleum Geologists) announced that they are in merger-talks. Both have been partnering in various aspects before. Focus groups and committees have been put in place. The plan, as announced in an SPE Eastern Hemisphere townhall meeting, is to bring this forward to member voting in both associations in Q2 2022. Details are still in discussion; the pathway planning will start in October now. Governance likely will be similar to the current SPE structure, with a board of geographic and technical directors and a new president elected annually.

What the townhall also explained: it is not primarily about financial synergy, but about a fast-changing world around us where our both's home turf is shrinking and where the more technical SPE and the geoscience AAPG can be stronger together.

There are of course slightly varying foci and interests of not just the two associations, but also of members of different regions. In the US, most of the business is still the core of petroleum. In parts of Europe such as Germany, this is broader and many of us are having different foci such as geothermal, underground gas storage or even nuclear waste disposal. The energy transition is driving more of us – especially the younger – than traditional oil wells. You can see that for example in the relatively higher attendance numbers of GSSPE webinars that focus on energy transition topics.

This regional difference likely is true for AAPG as well, which is much more US-centric than SPE. A merger-website with FAQs, timeline and other details has been set up here.

So SPE is the larger, more diverse partner in this merger. It also hosts more conferences and there are more SPE papers.

AAPG has ~100 regional or national affiliate societies. In Germany this is the BDG (Berufsverband Deutscher Geowissenschaftler e.V.). Different from SPE this does not mean automatic membership also in AAPG for BDG members. BDG has staff, whereas the GSSPE is run by volunteers.

SPE International	AAPG
~140.000 members	~40.000 members
~70.000 student members	~8.000 student members
Outside US/Canada: ~ 58%	Outside US: ~39%
144 countries, 201 sections, 396 student chapters	129 countries, 7 US sections and 6 Regions outside the US
Offices in Richardson/TX near Dallas, KL, Calgary, London, Houston, Dubai, Moscow	Offices in Washington DC, London, Dubai, Singapore, Bogotá, Lagos

Overview of the two organizations

There are also some AAPG student chapters, such as in Stavanger, at Gubkin or at AGH. However, the only German chapter in Freiberg currently is suspended. Similar to SPE there is a focus on Young Professionals with even a dozen YP chapters, mostly in the Americas.

This merger would of course also have effects on the German SPE section and its student chapters. So please, get involved. Write down what you think and let your voice be heard at https://www.aapg-spe-merger.org/contact. Let them know thumbs up or down, what you think about the general direction of the possible merged entity, its name requirements, and anything else that you would like your association to move ahead with. This is the time to do it. Everything is still up for discussion.

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Fluid inclusions: a universal tool in modern geology. Fluid evolution of HFSE (high field strength elements) mineralized alkaline pegmatites, Mount Malosa, Malawi

KONRAD BEHNKE, RWTH AACHEN UNIVERSITY

1.Introduction

High field strength elements (HFSE), including the more known rare earth elements (REE) are critical metals used in many new emerging technologies, especially in those that are focused on environmental and energy-saving applications. Elements that belong to this group are Zr, Nb, Hf, Th, U, Ta, and the essential group of rare-earth-elements (REE) that are defined as the 15 lanthanides together with Y and Sc (Salters, 1998; Wall, 2014; Hatch, 2012; Goodenough et al., 2016). These elements became irreplaceable components in various technical applications like alloys, batteries, and computer chips. Therefore, they were classified by many leading industrial nations like the US and the EU as critical for their economy. This is mainly due to their problematic supply chain as the RRE's production is mainly controlled by China and is considered vulnerable due to continued export restrictions. The ongoing rising demand of the high-tech industry and problematic access to these elements resulted in a substantial increase in the number of studies designed to understand the chemical behavior of these rare metals to access new resources, to become more independent and involved in the supply chain (Hatch, 2012; Nassar et al., 2015; Goodenough et al., 2016). However, information about most HFSEs, their hydrothermal behavior, preferred ligands, and complexation systems, and mineral solubilities is still scarce, often only empirical, and not well documented, especially in the few rare natural systems (Migdisov et al., 2016).

One of such rare HFSE-rich natural systems is the Cretaceous Chilwa Alkaline Province (CAP) in southern Malawi, consisting of more than 20 shallow large igneous intrusions. The igneous province is associated with the alkaline volcanism of the East African Rift (Figure 1) and consists of several large intrusions related to HFSE-rich carbonatites and granitic pegmatites (Woolley, 1991; Eby et al., 1995). Especially Mt. Malosa, the study area and an intrusive syenite-granite complex in the northern part of the CAP, has been known for several decades for various rare and HFSE-rich minerals related to hydrothermal alteration systems in pegmatites. Therefore, this barely studied rare system offers the unique opportunity to understand the hydrothermal system better and determine critical aspects that led to the mobilization, transport, and precipitation of the HFSEs. The information of this long-vanished magmatic-hydrothermal environment is trapped in quartz crystals from miarolitic cavities in the form of microscopic fluid inclusions, which formed during the crystal growth in pegmatite dikes. These inclusions represent small time capsules that provide essential insights into the magmatic-hydrothermal history of the whole system and are, therefore, the primary focus and approach of this study.

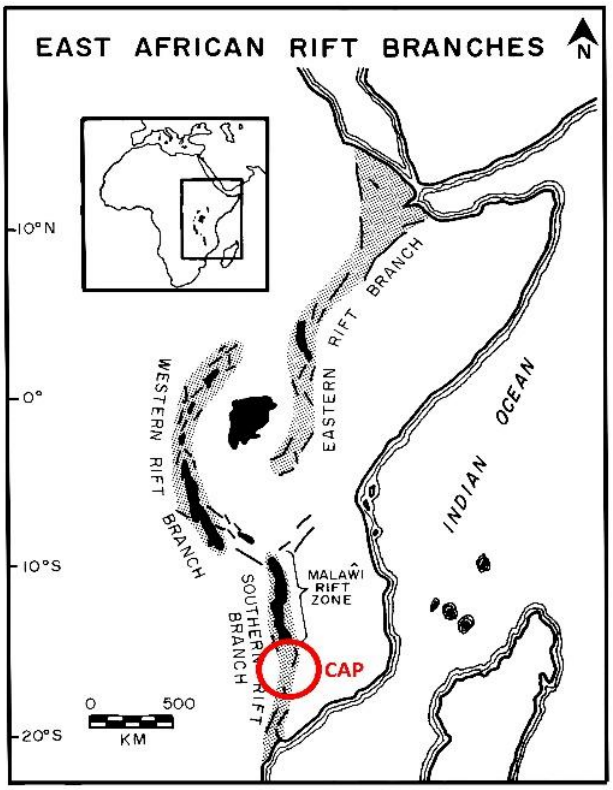

Figure 1 - Map of the East African Rift System. The Chilwa Alkaline province (CAP) marked with a red circle and is located below the Malawi Rift Zone of the Southern Rift Branch. Modified after Specht and Rosendahl (1989).

2. Fluid Inclusions

During the growth of a crystal in the presence of a fluid phase, the surface of the crystal will inevitably be imperfect. During the continuous crystal growth, these micrometer-sized imperfections will be engulfed by the surrounding crystal, creating a vacuole in which tiny samples of the fluid may get trapped in the host mineral. Once sealed-off, the vacuole is characterized as a fluid inclusion and contains the fluid that was present during the crystal growth and was responsible for the precipitation of the crystal (Goldstein and Reynolds, 1994; Bodnar, 2003a; Bodnar et al., 2014). This entrapment can either happen during the initial growth of the crystal or during the healing of fractures in the host mineral in the presence of a fluid.

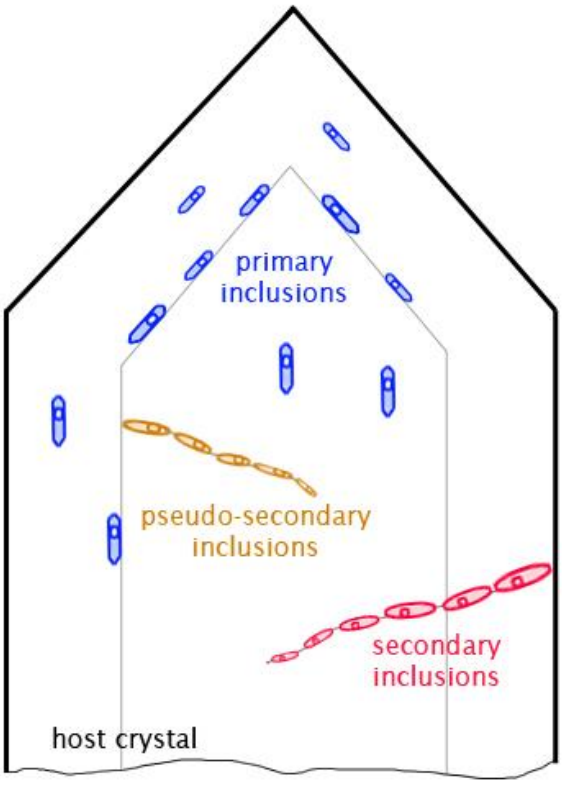

Figure 2 - Schematic illustration of the formation of primary, secondary and pseudosecondary fluid inclusions (Gems-inclusions.com, 2020).

Inclusions that are trapped during the initial formation of the enclosing crystal are termed to be of primary origin (P). They occur along the growth zones of the crystal, crystal faces and are often isolated. Fluid inclusions trapped in fractures that developed after the crystal formation are called secondary inclusions (S). The recrystallization of the fracture traps the inclusions, which then occur as trails or clusters that cut crystal boundaries. If the healing of a fracture occurs during the ongoing crystal growth and the fracture is completely sealed-off again, these inclusions are classified as pseudosecondary (PS). These inclusion types provide a classification to establish temporal relationships (Goldstein and Reynolds, 1994; Bodnar et al., 2014). An illustration of the different fluid inclusion types is shown in Figure 2.

According to Goldstein and Reynolds (1994), fluid inclusions can be seen as microscopic time capsules that store the physical and chemical information of the fluid during entrapment, including temperature, pressure, and fluid compositions. Fluid inclusions provide information on the chemical and physical character of fluids during crystal growth and the possibility to reconstruct the hydrothermal history of the long-gone aqueous system. Volatile constituents and soluble salts that pass through the system leave almost no traces in rocks except for the trapped fluid in fluid inclusions (Roedder, 1984; Bodnar et al., 2014). The trapped fluid may have many different chemical and physical properties and may be a liquid, vapor, or supercritical fluid during the entrapment (Bodnar, 2003a). Exemplary fluid inclusions from Mt. Malosa are shown in Figure 3.

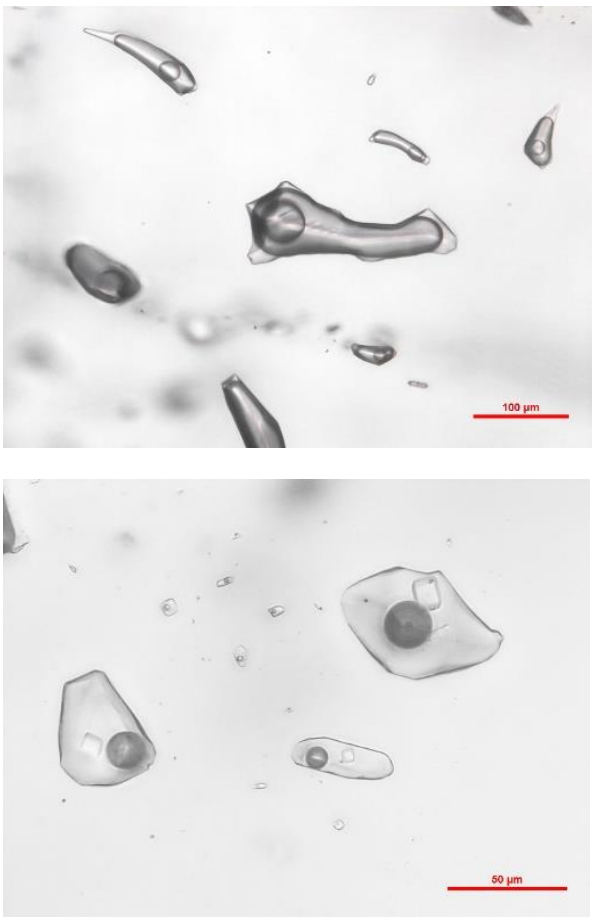

Figure 3 – Fluid inclusions found in the samples from Mt. Malosa. Top: carbonic inclusions with an aqueous and carbonic liquid. Bottom: fluid inclusion with an aqueous liquid and cubic halite crystal.

Data obtained from fluid inclusion studies contribute significantly to the understanding of hydrothermal ore-

forming processes in most types of hydrothermal deposits and environments. Therefore, fluid inclusions are handled as the tool that contributed more to the understanding of hydrothermal systems and ore deposits than any other analytical tool in the past half-century (Bodnar et al., 2014). Fluid inclusions represent the most direct and, in many cases, most accurate and only geothermometer technique for estimating the temperature of crystal growth, the ore formation, and involved mineral solubilities (Roedder, 1984; Bodnar et al., 2014).

3. Approach and goal

A comprehensive fluid inclusion study was applied to miarolitic quartz samples from alkaline pegmatitic dikes from Mt. Malosa, which are known for HFSE-mineralization and late hydrothermal fluorocarbonate-HFSE-replacements. This study aimed to reconstruct the physico-chemical evolution of the magmatic-hydrothermal fluids from the alkaline pegmatites located at Mt. Malosa. This investigation's approach is based on a fluid inclusion study whose main focus are the microscopic fluid inclusions, but also mineral inclusions located in euhedral quartz crystals. The concentrations of HFSE and other elements were determined in representative aqueous fluid inclusions, and the key controls of the HFSEs on their solubility are investigated. Based on this, the potential role of hydrothermal fluids in the transport of HFSE and REE in alkaline magmatic systems were evaluated. All this was achieved by the following multi-methodical approach and methods:

I. Fluid and mineral inclusion petrography is the first step in this study and is used to create a spatial and temporal framework of the fluid and mineral inclusions in the thick sections from the quartz samples. These textural relationships provide a basis for the fluid inclusion study and all following methods to place their results in a paragenetic framework (Figure 4). This fluid inclusion study was based consistently on the fluid inclusion assemblage (FIA) approach suggested by Goldstein and Reynolds (1994). Groups of fluid inclusion populations are placed in a temporal and spatial framework based on their petrographic relationships in the crystal and grouped together. An FIA is the most finely discriminated, petrographically associated group of inclusions that are recorded together as a group. This implies contemporaneous entrapped based on petrographic features such as growth zones or healed fractures and, therefore, also homogenous physical and chemical properties creating a larger statistical representative data basis (Roedder, 1984; Goldstein and Reynolds, 1994).

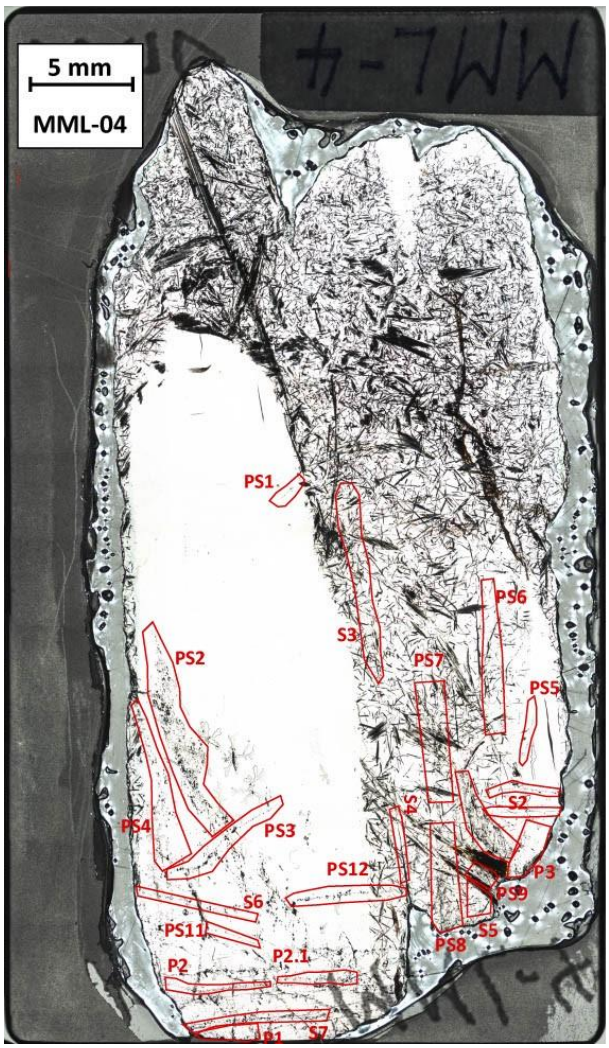

Figure 4 – Thick section of quartz crystal sample MML-04 from Mt.Malosa showing the identified fluid inclusion assemblages in red.

II. Optical cathodoluminescence (CL) is the second applied method in this study in order to qualitatively characterize growth zonation and luminescent mineral inclusions in the quartz, which is the host rock of the fluid inclusions. The CL is a non-destructive analytical method that provides quantitative information regarding the petrological and mineralogical characteristics by the emission of visible spectra of light. The cathodoluminescence is created by a beam of electrons from a cold electron cathode that interacts with luminescent materials during their impact on a surface. Due to their unique electron shell configuration, HFSEs are special activator elements that cause intense and characteristic emissions (Pagel et al., 2000; Götze, 2012). An exemplary luminescent mineral from Mt. Malosa is shown in Figure 5.

III. Electron microprobe (SEM-EDS) is the third applied method in this study and is used in the energy dispersive spectrometer (EDS) mode to rapidly determine the composition of mineral phases enclosed in the quartz qualitatively. Additionally, the scanning electron

microscope (SEM) for imagery was used to produce backscattered electron images (BEI) that provide compositional information images. The electron microprobe is a non-destructive analytical method, and the EDS mode provides qualitative compositional information of minerals and is based on the focused emission of an electron beam on the sample. This results in the emission of X-rays, whose energy intensity is element-specific (Reed, 2005).

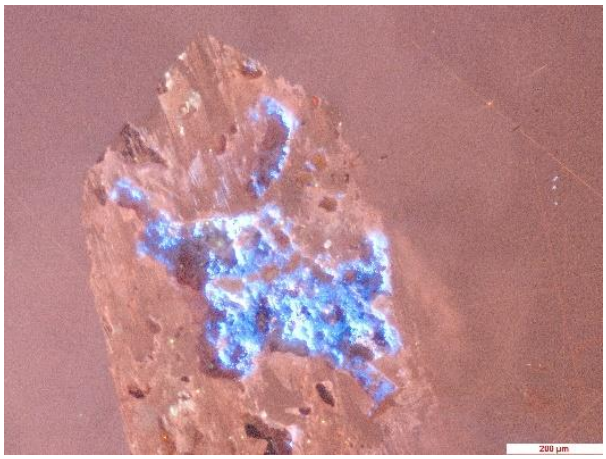

Figure 5 – Cathodoluminescene response (blue) of an unknown intergrown alteration mineral in quartz (red brown) of sample MML-02-2

IV. Raman spectroscopy is the fourth applied method in this study and is a non-destructive technique that allows quantitatively to identify gaseous and liquid phases in fluid inclusions and enclosed mineral phases. The Raman spectroscopy is based on the measurement of the inelastic scattering of light from a laser beam that is reflected back from molecules and allows the rapid characterization of samples as small as 1 µm in diameter. This inelastic scattering is called the Raman effect, and it provokes a molecule-specific change to higher and lower frequencies in the scattered light (Burke, 2001; Frezzotti et al., 2012).

V. Microthermoetry is the fifth applied method in this study and is the determination of temperatures of phase changes within fluid inclusions by either cooling or heating them in a modified microscope. The technique is used to obtain the formation temperatures of the samples, the fluid salinity, and the pressure condition of the fluid inclusions. This information is used to reconstruct the hydrothermal history and as a calibration starting point for the following LA-ICP-MS measurements. Obtained physical information during the initial freezing step of up to -100°C are the melting temperatures of different ice phases and the homogenization temperatures (Th) of up to 500°C of vapor and liquids. The obtained temperatures of phase changes are then used to calculate the total salinities with the binary NaCL-H_2O and the ternary solubility model of the NaCl-KCl-H_2O system under vapor-saturated conditions (Roedder, 1984; Goldstein and Reynold, 1994; Wilkinson, 2001).

VI. Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) is the sixth and last applied method in this study and a unique technique for quantitative multi-element microanalysis throughout a large range of concentrations. The LA-ICP-MS method is used to quantitatively obtain highly time-resolved compositional information by the in-situ sampling of the previously petrographically identified fluid inclusion assemblages for major and trace element analysis (Heinrich et al., 2003). The method is a three-part system that consists of an optical microscope with a sample chamber and a pulsed laser that acts as a drill and a connected mass spectrometer, which measures the content of the 'drilled' fluid inclusions as soon as it is breached (Heinrich et al., 2003; Thomas, 2013).

4. Results

Numerous fluid inclusions were identified in every sample from Mt.Malosa, and in total, 13 types of fluid inclusions with five different phases were recognized in over 150 fluid inclusion assemblages. These different phases were represented by an aqueous fluid (water), vapor, solid halite, siliceous melt, and liquid carbon dioxide. In total, 710 freezing and 550 heating experiments were conducted, and the averaged calculated total salinities range between 6.2 and 42.7 wt% and exhibit variable temporal trends. As a comparison, the average seawater has a salinity of about 3.5wt% and the highly saline Dead Sea about 34wt%. Homogenization (formation) temperatures range between 150 and 450 °C with pressure-correct values between ca. 300-600 °C and therefore cover hydrothermal to magmatic-hydrothermal ranges but are also close to the range of crystallization temperatures of pegmatites (Nabelek et al., 2010; Marks and Markl, 2017). An overview of the microthermometry results is illustrated in Figure 6. Identified mineral inclusions consist of alkaline Na-Ca amphiboles and pyroxenes like aegirine ($NaFeSi_2O_6$), riebeckite ($Na_2(Fe^{2+}{}_3Fe^{3+}{}_2)Si_8O_{22}(OH)_2$, and rare astrophyllite ($K_2NaFe^{2+}{}_7Ti_2Si_8O_{26}(OH)_4F$), often associated with Ca-alteration. An exemplary mineral inclusion is shown in Figure 7. Opaque minerals consist mainly of pseudomorphic replacement structures of those mineral inclusions and are spatially closely associated with carbonic inclusions and identified HFSE-minerals in the quartz, like xenotime-(Y) (YPO_4), zircon ($ZrSiO_4$), ilmenorutile ($(Ti,Nb,Fe)O_2$) and foordite ($Sn(Nb,Ta)_2O_6$), which are of clearly hydrothermal origin.

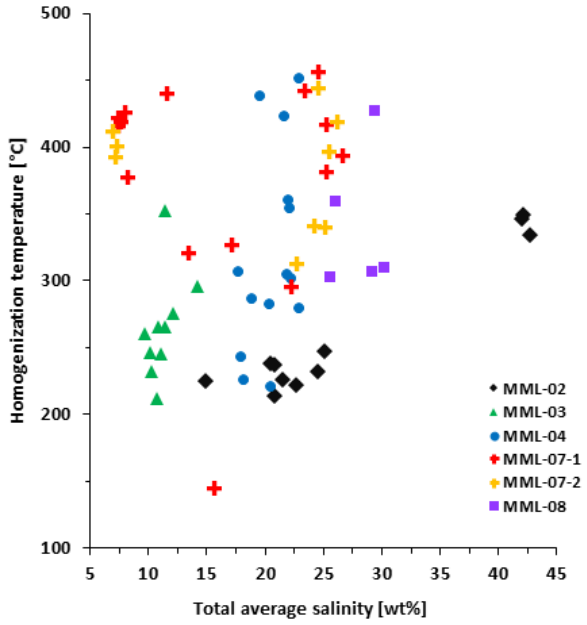

Figure 6 – Measured total average salinities in wt% of each FIA from the samples from Mt. Malosa plotted against homogenization temperatures in °C.

A late spatially and temporarily limited metasomatic HFSE-mineralization event is inferred to have taken place, which was also found in a similar form in other alkaline HFSE-deposits like at the Strange Lake or Thor Lake deposits in Canada (Vasyukova et al., 2016)

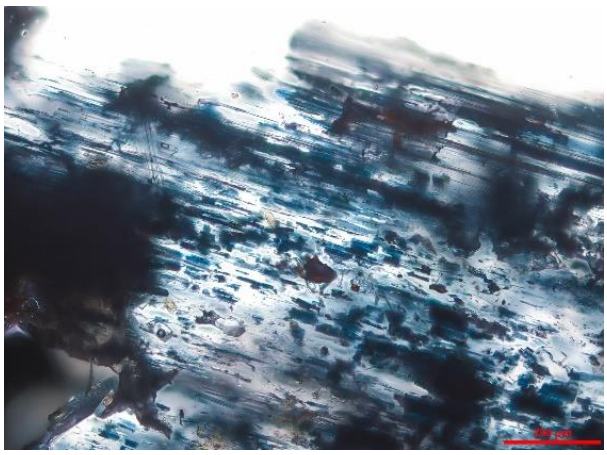

Figure 7 – Bluish translucent riebeckite mineral inclusions in sample MML-02-2.

In total, the chemistry of 113 fluid inclusions was successfully studied. Measured HFSE concentrations range between 22 and up to 2241 ppm, indicating significant enrichments. These measurements also represent some of the first in-situ measurements of HFSE concentrations in fluid inclusions until today. As a comparison, the average concentration of all HFSE in the solid continental crust is about 400 ppm (Wedepohl, 1995), but fluids usually only dissolve a tiny, mostly not measurable fraction of these concentrations. A representative example of a fluid inclusion signal illustrated by five of the 31 measured elements of the LA-ICP-MS is illustrated in Figure 8.

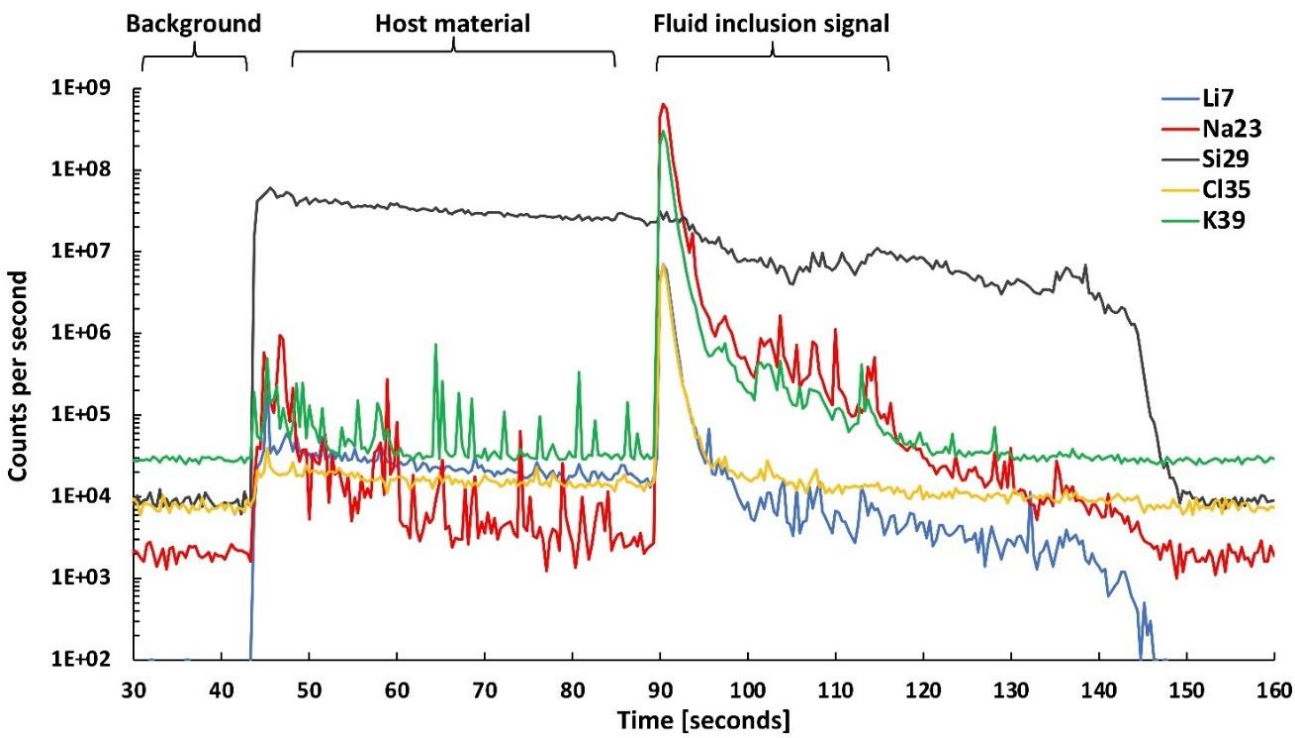

Figure 8 - Exemplary fluid inclusion measurement with the LA-ICP-MS method showing major elements. Peak of the fluid inclusion indicates the breach of the fluid inclusion in the quartz by the laser and the instant spallation and evaporation of the fluid.

Unfortunately, critical controls on HFSE mobility and enrichment remain uncertain as no clear trends and correlations are visible, except for a weak correlation to the total salinity and calcium. The fluid chemistry indicates a highly fractionated signature in the earliest orthomagmatic assemblages similar to other known pegmatites. This signature decreases significantly toward younger fluid inclusion assemblages, which are assumingly influenced and diluted by external fluids, like metasomatic fluids. Phase separation due to effervescence and probably fluid immiscibility is assumed to be the major cause of the salinity and Th variability. Processes like progressive fluid-rock interactions and alteration are other potential causes for the observed variability

The results of this study emphasize the importance of hydrothermal systems and distinct alteration and fluid chemistry for HFSE-mineralization in alkaline pegmatites. The spatial link of HFSE to pseudomorphs, carbonic inclusions, and the suggested fluid-rock interactions provide the basis for future research. The measured fluid chemistry is also a valuable basis for future ligand complexation research and modeling, which is a crucial unsolved factor in these rare, occurring HFSE deposits. Mt. Malosa will remain a highly underexplored and, for HFSE-related research, valuable natural phenomenon, which still needs to be entirely understood.

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GSSPE YP contribution in GeoKarlsruhe 2021

YOUNG PROFESSIONAL GROUP, GSSPE

GSSPE Young Professionals & SGA joined virtual booth. GeoKarlsruhe 2021 Conference

From 19th-24th of September, the German Geological Society (DGGV) hosted its GeoKarlsruhe 2021 conference with the focus on the topic "Sustainable Earth - from processes to resources" at the Karlsruhe Institute of Technology (KIT). The DGGV, which is the largest geological society of Central Europe, invited around 700 participants with 36 different nationalities.

The German SPE section was actively involved in two different schemes. Firstly, the SPE presented the successful format called "GeoEnergy Exploration Game", a development by the local SPE chapter itself. It earned positive perception amongst the participants. Secondly, the SPE young professional group (YP) participated with a virtual booth, jointly hosted together with the "Society for Geology Applied to Mineral Deposits" (SGA). This led to a vivid exchange not only with the audience, but also between the SPE and SGA, which share a lot of common background knowledge and interests.

The SPE YPs have actively communicated their message through the organized "speed dating" arrangement and several coffee breaks. During these, the participants seized the opportunity to engage the SPE and inform themselves about its activities reaching beyond the area of geology alone. In the meantime, the organizers utilized the advantages of the digital technology and allowed for a knowledge sharing process within six parallel sessions. This way a rapid transition from one session to another was possible, ensuring that no presentation or talk about the main topics of energy, raw materials, Bigdata and water was missed out on.

The German SPE chapter thanks the conference leaders Prof. Dr. Christoph Hilgers (KIT) and Dr. Jürgen Grötsch (DGGV), as well as the local SGA chapter, represented by Alannah Brett and Simon Hector, for allowing us to actively participate in this great event.

Joshua Siwert & Rasoul Foroutan
On behalf of the Young Professional Group, GSSPE

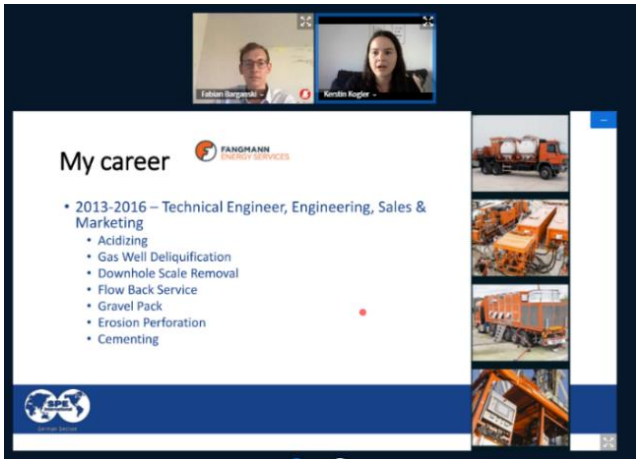
GeoKarlsruhe 2021 Conference Leaders. Prof. Dr. Christoph Hilgers, KIT (left) and Dr. Jürgen Grötsch, Shell, and DGGV president (right).

Online SPE Ambassador Lecturer Program @ TU Clausthal

YOUNG PROFESSIONAL GROUP, GSSPE

On 15th June SPE Germany YP group offered an Ambassador Lecture for our students in TU Clausthal SPE chapter. The SPE Ambassador Lecturer Program (ALP) is an initiative which helps to educate, inform, and develop the skills of the next generation of professionals in the petroleum industry. Usually, Young Professionals (YPs) get invited from schools or universities to share their knowledge about the E&P industry, to share their professional experiences, and to answer the student's questions about career development and about SPE in general.

This online event was hosted by SPE TU Clausthal chapter and moderated by Fabian Barganski, President of TU Clausthal SPE chapter. Kerstin Kogler, SPE Germany Young Professionals group officer has lectured this event. Kerstin completed both her bachelor and master's degree in petroleum engineering at Montanuniversität Leoben. She recently achieved her PhD degree in petroleum engineering and geothermal energy recovery at Montanuniversität Leoben. Kerstin is currently Editor-in-chief at Erdöl Erdgas Kohle / Oil Gas European magazine (DVV Media Group GmbH) and Lecturer at Celle Drilling School.



This online event started with description of Ambassador Lecture Program and later continued with introduction to SPE Germany Young Professionals group activities and future events. Next the lecturer remarked her own educational background and career pathway. In addition, Kerstin has shared her own professional experience with students.

ALP event ended with Q&A section where students asked their questions and got support and up-to-date information from the lecturer.

Rasoul Foroutan & Kerstin Kogler
On behalf of the Young Professional Group, GSSPE

Ambassador Lecturer Program (ALP)

SPE International
Society of Petroleum Engineers

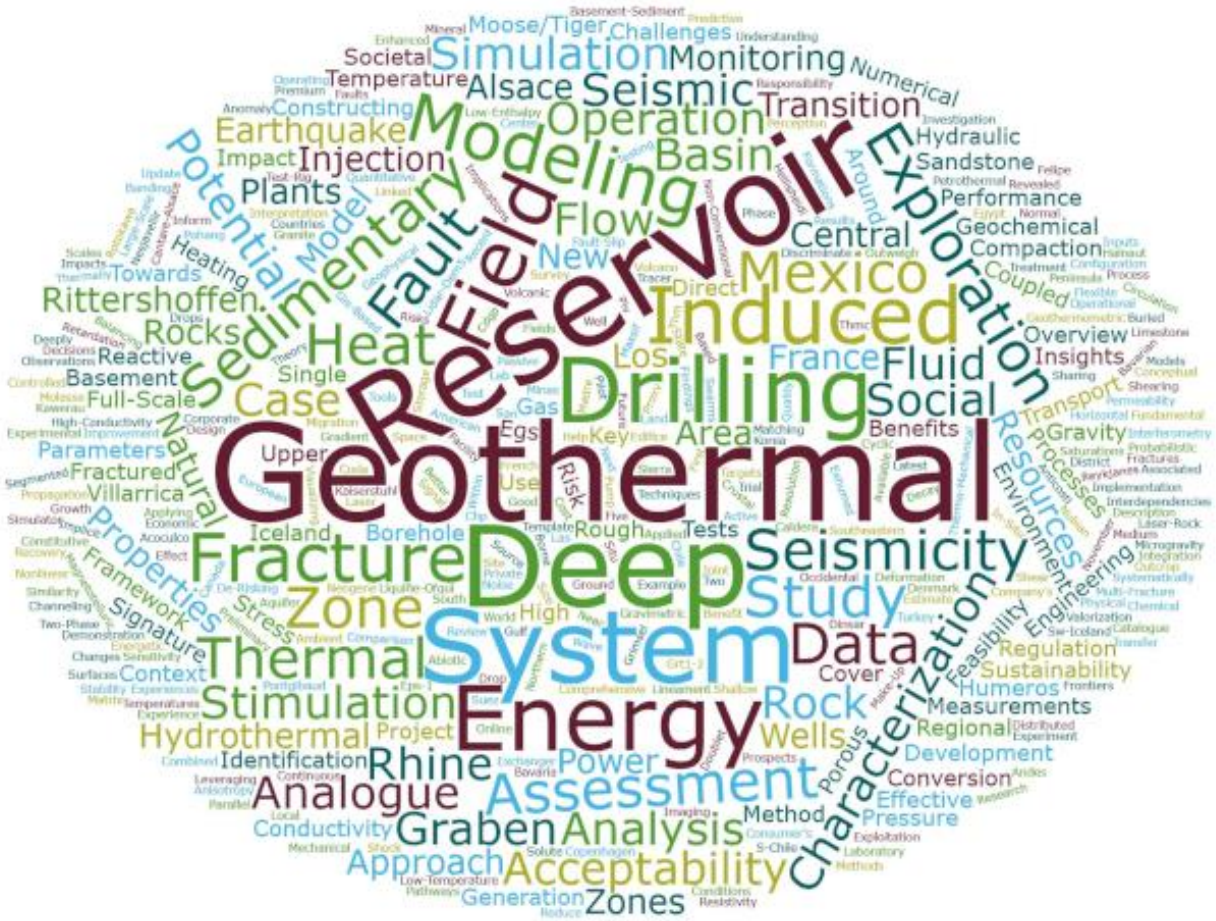
What is ALP?

- Young Professionals (YPs) visit student chapters, universities and higher education schools to inspire and inform the next generation of engineers.
- YPs gain valuable presenting experience, with tips and tools to support them from SPEI. Recorded visits go toward your volunteer records.
- ALP visits share vital information on current industry trends to prospective engineers, supporting the future of the industry.
- YPs can give back and support the future of the industry.

Website: www.spe.org/members/ambassador-lecturer-program **Contact us** alp@spe.org

Geothermal News

By Valentin Goldberg, Karlsruhe Institute of Technology



Research topics in geothermal (Image Source: https://geothermics.agw.kit.edu/EGW2021.php).

Cutting-edge science at the 9th European Geothermal Workshop at KIT

With great participation, the 9th European Geothermal Workshop (EGW) at Karlsruhe Institute of Technology (KIT) took place on 23rd and 24th September 2021. The workshop is a joint initiative of the University of Strasbourg and KIT organized annually in an alternating schedule between two institutions. The EGW is chaired by Thomas Kohl from KIT and Jean Schmittbuhl from the University of Strasbourg.

The European Geothermal Workshop (EGW) aims to discuss new scientific and technological approaches, methods, or data in the field of deep geothermal reservoirs for energy exploitation. This year's focus was on “high-temperature thermal energy storage”. The EGW provides a platform for scientific exchange, especially between Ph.D. students and scientists.

The growing interest in the 9th event of the EGW series is reflected by many young and experienced scientists from 21 countries from all over the world as the USA, Norway, South Africa, or Iran registered for the workshop. A total of 160 participants attended over 40 scientific oral or poster presentations, including keynotes of renowned scientists. The different technical sessions discussed the most important topics for bringing the geothermal industry to a new level and unlock its large potential especially here in central Europe. With topics as ‘new geothermal utilization schemes’, ‘Sustainability, Environment and Regulatory’ or Computing and Data Management, Machine Learning’ among many others several future-orientated topics were tackled.

Source:

- Karlsruher Institut für Technologie: European Geothermal Workshop 2021

Image Source: https://www.land.nrw/de/pressemitteilung/wettbewerb-waerme-aus-tiefengeothermie-fuer-nordrhein-westfalen-land-foerdert-drei

Contest "Wärme aus Tiefengeothermie für NRW" – EUR 1.5 million in funding for three region geothermal clusters

The state of North Rhine-Westphalia wants to intensively promote the expansion of regenerative heat supply. In this regard, the Düsseldorf Ministry of Economic Affairs and Energy announced the competition "Wärme aus Tiefengeothermie für NRW" (Heat from deep geothermal energy for NRW) last fall. The competition was aimed at municipalities or municipal consortia. In cooperation with industry and research, the goal is to investigate the potential of deep geothermal energy and the involvement of citizens in such projects.

The deadline for submissions was February 28, 2021. All applications received were evaluated by an independent expert jury consisting of external reviewers and representatives of the Ministry of Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia.

Three applications convinced the jury: The regional clusters Düsseldorf/Duisburg, Düren/Kreuzau and the Gardening region Straelen will each receive around EUR 500.000 for the development of feasibility studies. The studies are each funded for two years and cover a wide variety of topics. The Düren-Kreuzau cluster is looking at temperature level requirements in three different use cases as the paper and textile industries and metal processing. On the Düsseldorf side, the Düsseldorf-Duisburg cluster is investigating the supply of decentralized local heating networks. In Duisburg, the cluster is investigating the central supply of heat from deep geothermal energy to the existing district heating network. The city of Straelen is focusing on local horticulture. The consortium wants to investigate how roses or tomatoes can be produced emission-free with renewable heat in the greenhouses.

Source:

- Energie Agentur NRW: Förderwettbewerb „Wärme aus Tiefengeothermie für NRW“ hat drei Sieger
- WIR IN NRW: DAS LANDESPORTAL: Tiefengeothermie Nordrhein-Westfalen: Wettbewerb Wärme aus Tiefengeothermie für Nordrhein-Westfalen: Land fördert drei Machbarkeitsstudien mit EUR 1,5 Millionen

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