

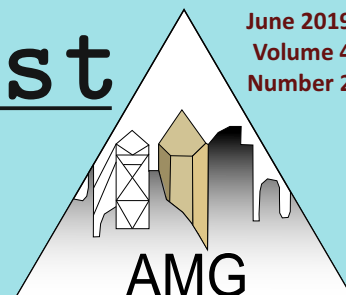
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From the AMG committee

Hello and welcome to the June edition of *Applied Mineralogist*! In this issue, we present our special feature on the **future applications of natural zeolites**, together with notes from the **Critical metals meeting** and a preview of the upcoming **SGA biennial meeting**. Lastly, we have some more information for you on the **Minerals in a Sustainable Future meeting**.

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The SGA Biennial Meeting, Glasgow, 27th to 30th August 2019

Jon Naden, British Geological Survey



15th Biennial SGA Meeting
Glasgow, Scotland
August 27 -30 2019



The Biennial meeting of the SGA (Society for Geology Applied to Mineral Deposits) will be held in Glasgow 27–30th August 2019. To date, there have been over 500 abstracts submitted to twelve thematic sessions. The sessions are:

- Co-evolution of Life and Ore Deposits
- Minerals for Green Growth
- Advances in understanding hydrothermal processes
- New techniques for ore discovery
- New discoveries – new views: advances in the science of mineral exploration
- Magmatic-hydrothermal systems: from Porphyry to Epithermal
- Magmatic sulfide and oxide systems
- Gold – from orogeny to alluvium
- Economics of ore deposits
- The changing face of metal extraction - geology, biology and geometallurgy
- Sustainable development of ore deposits
- Supergenes, gems and non-metallic ores
- Open session
- Young Geologist Forum - prospects in mineral deposits industries

All sessions include international keynote speakers. The conference also has a range of workshops and fieldtrips, which can be viewed on their website.

An interesting short course will take place on 25-26 August entitled “Resources in Carbonatite and peralkaline rocks: Everything you wanted to know but were too shy to ask” by Adrian Finch and Frances Wall.

For more information, please visit <https://www.sga2019glasgow.com/short-courses>.

Further details and online registration are at <https://www.sga2019glasgow.com/>

Natural zeolite as nanocomposite geomaterial for pharmaceutical and environmental purposes

Mariano Mercurio, Università degli Studi del Sannio, Italy.

Although natural zeolites, tecto-alumino-silicate hydrates, have been studied for many years, they still give us some nice surprises! There have been several recent contributions on possible novel applications of these widely occurring and low-cost natural nanomaterials that are often considered to be waste materials. These applications are devised by materials engineers, mineralogists, biotechnologists, pharmacists as well as geologists, environmental engineers, architects and chemists) who work with industrial minerals in order to solve environmental and healthcare problems¹. Any critical literature review reveals that a mineralogical approach for such technological applications of nano-geomaterials is essential, especially when these materials occur in natural and often heterogeneous deposits.

Natural zeolites have chemical-physical features which make them very versatile from a technological view point. One of the main technological properties is the cation exchange capacity (CEC). In fact, the CEC value for zeolites ranges from 2 to ~5.5 meq/g, mainly as a function of the ratio of silicon/aluminium present within the framework. Much attention has been paid to the ability of zeolite materials to exchange positively charged ions or molecules in order to mitigate environmental and health risks. Recent effort has focused on making these minerals anionic exchangers. This is possible because cation

exchange can occur at the zeolite mineral surface. This has enabled the creation of bilayers at the mineral surface by functionalization with cationic surfactants which have little environmental impact (Figure 1).

Our research group has confirmed that new composite materials, based on zeolitic support (natural zeolite-surfactant-drug), can act as a carrier in a drug-delivery capacity². Such composite geomaterials can also be used in the removal of oxyanions and chlorinated solvents which have contaminated aquifers. Work is also being done on the use of functionalized natural zeolites in the removal of some 'emerging contaminants' (ECs) from stream waters.

[1] M. Mercurio, B. Sarkar, A. Langella (eds). *Modified Clay and Zeolite Nanocomposite Materials: Environmental and Pharmaceutical Applications*. Elsevier, 2018, 362 pp.

[2] M. Mercurio, F. Izzo, A. Langella, C. Grifa, C. Germinario, A. Dakovic, P. Aprea, R. Pasquino, P. Cappelle, F.S. Graziano, and B. de Gennaro. *Surfactant-modified phillipsite-rich tuff from the Campania region (southern Italy) as a promising drug carrier: An ibuprofen sodium salt trial*, 2018, *American Mineralogist*, 103, 700-710.

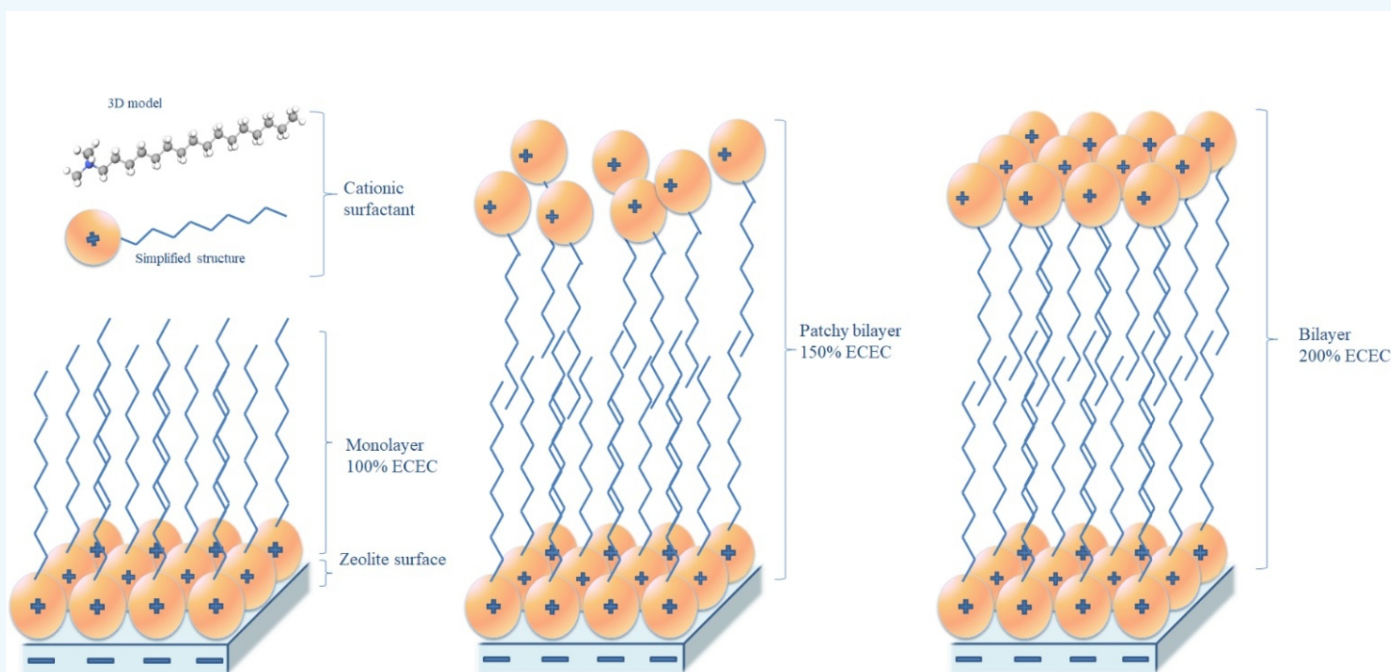
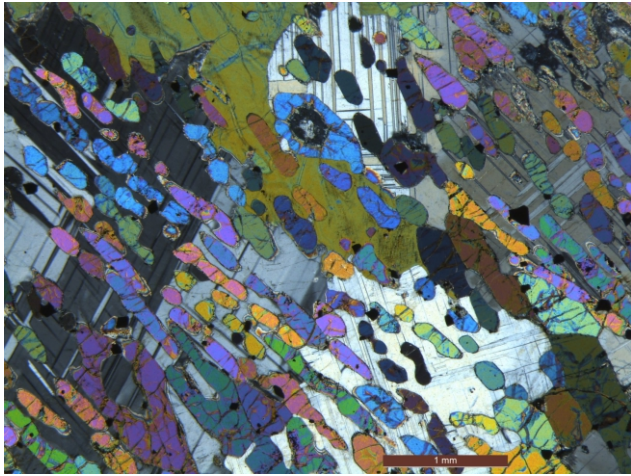


Figure 1. A representative 3D functionalization sketch of zeolite (made by Danijela Smiljanic).



#AppliedMineralogy @FaithfullJohn

From your #ThinSectionThursdays, #FieldworkFridays & #MineralMondays, our #AppliedMineralogy winner is...

@FaithfullJohn!

With a cross-polarized image of a skeletal olivine peridotite, with plagioclase and clinopyroxene oikocrysts from the Rum Layered Intrusion!

3rd International Critical Metals Meeting Roundup, Edinburgh, United Kingdom. 29th April-2nd May 2018. Dylan Price, University of Edinburgh

Held in the city dubbed the birthplace of modern geology, Edinburgh was a fitting city to welcome a diverse range of experts on all topics extending from the geology to the uses and economic ramifications of critical metals. The 3rd International Critical Metals Meeting saw a series of speakers bringing forth a refreshing range of complementary topics from academic, industry and non-profit perspectives.

The session themes traversed the supply chain of these critical metals, giving all of us a deeper grasp of the full extent of the larger context surrounding these elements, and not just that concerning our specific field. The talks ranged from the intrinsic geology of deposits, through responsible sourcing practices to the end use in low-carbon transport and future prospects of the metals. This was very much helped by the highly relevant keynote speakers offering insight into just how interconnected all these facets are.

On a personal note, hearing the in-depth and well-illustrated talks about the challenges and opportunities around low-carbon transport, or sustainable acquisition of such metals nicely shows how my own work (and others) integrates into the bigger picture and really spurs me on for my own project. Although the lovely optimistic talks were inspiring, I thoroughly enjoyed the few talks that put brakes on all the hype, took a step back and asked some questions on “why” rather than “how”.

Beyond the talks, the conference was full of other activities too. It was preceded by a fieldtrip, which was accentuated by the excellent weather, and a relaxed evening reception held next to Edinburgh's Arthur's seat – an extinct volcano. The coffee breaks between sessions complimented the dedicated evening poster session which saw work from students and academics

alike being put on display.

Overall, the conference was great fun and I highly enjoyed the diverse yet interconnected talks, as well as the general inquisitive and good-natured atmosphere. A big thank you to the organising team, whose hard work ensured that everything ran seamlessly.

Thanks from the organisers

The organising committee of the 3rd International Critical Metals Conference would like to extend their thanks to the delegates for their engagement and for embracing our approach, to our keynotes for their excellent introductions and overviews of topical issues for critical metals, and to our venue, Surgeon's Hall, for the smooth running of the meeting. We would like to congratulate our student prize winners, Dylan Price (University of Edinburgh) for best poster presentation and David Kaeter (UCD) for best oral presentation. Without the backing of the community, meetings like this are very difficult to run, so we are very grateful for the support of the organisations below.



Minerals in a Sustainable Future

09:30 - 16:45, 13th June, British Geological Survey, Keyworth, Nottingham, NG12 5GG

This one-day joint Applied Mineralogy Group- Environmental Mineralogy Group Research in Progress Meeting will include keynote talks by:

Andrew Bloodworth, British Geological Survey (*Charging ahead: Decarbonisation, electric vehicles and the new age of metals*) and

Ronan Courtney, University of Limerick (*Ecological engineering approaches for the rehabilitation of mine processing residues [tailings]: A case study with bauxite residue*).

There will be oral presentations, poster displays and a prize-giving session at the end of the day.

A buffet lunch and refreshments will be provided and there are optional SEM demonstrations before and after the event.

Delegate spaces are still available, for a very reasonable £10 registration fee. Registration is available using this [link](#), where you will find a programme and further information. We look forward to seeing you on the day.

Please contact the organisers: [Eimear Deady](#) or [Alicja Lacinska](#), for further information.

Notices

Get Involved

If you would like to become more involved in the AMG, we welcome interested members of the community. Positions for new student representatives come up regularly. If you would like to be considered for a committee spot please contact our secretary, Eimear Deady (Secretary).

AMG Postgraduate Bursaries

The AMG provides bursaries for postgraduate students in the disciplines of *Applied Mineralogy, Crystallography, and Petrology and Geochemistry*. Bursaries are intended to support conference attendance and associated travel costs, although other activities may be considered. Application guidelines can be found at www.minersoc.org/amg-bursaries

Please note there are two bursary application deadlines each year: 1st March and 1st September. Requests for funding must be received well in advance of the event to allow for consideration by the committee.

Funding

We welcome applications from both individuals or organisations for funding in support of events covered in the AMG remit. Further guidelines on how to apply can be found at www.minersoc.org/amg-funding

About Us

Founded in 1963 by Norman F.M. Henry, the AMG is a special interest group of the Mineralogical Society of Great Britain and Ireland. We encourage and promote the study and research of mineralogy applied to ores and related industrial mineral materials. This encompasses: ore microscopy, fluid inclusions, nuclear minerals, coals, refractories, slags, ceramics, building materials, nuclear waste disposal, carbon capture and storage, down-hole borehole alteration, and mineral-related health hazards.

Editorial

Thank you to those who have contributed to this issue of Applied Mineralogist. Please forward any articles, comments or notices of events and conferences to amgminsoc@gmail.com. All previous issues of Applied Mineralogist are available at www.minersoc.org/amg-applied-mineralogist

Thanks for reading; our next Applied Mineralogist will be out in September. Keep up on what is happening in the meantime by following us on twitter [@amg_min](https://twitter.com/amg_min).

Calendar

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|---------------------------|--|
| JUN '19
13 | Minerals in a Sustainable Future Meeting
<i>British Geological Survey, Keyworth</i> |
| JUN '19
21 - 26 | Resources for Future Generations
<i>Vancouver, Canada</i> |
| JUL '19
08 - 12 | Granites II
<i>Roscoff, France</i> |
| AUG '19
18 - 23 | Goldschmidt Conference
<i>Barcelona, Spain</i> |
| AUG '19
27 - 30 | SGA Biennial Meeting
<i>Glasgow, Scotland</i> |



Interested in joining the Mineralogical Society and Applied Mineralogy Group? Go to: <http://www.minersoc.org/> for membership details.

