The Environmental Mineralogy Explorer

The Biannual Newsletter from the Mineralogical Society's Environmental Mineralogy Group

Edited by: Latham Haigh

November 2024 Issue 5

Bursary Call

The next call for the EMG Bursary Scheme is approaching with the closing date for this cycle being **29th November 2024**. We offer bursaries for both PhD students and Early Career Researchers.

PhD students can apply for up to **£300** for development activities and ECRs can apply for up to **£1000** to facilitate new pilot research with the expectation of publication and/or further research funding.

For full details, visit our website at **minersoc.org/emg-bursary**

Environmental Mineralogy Photo Competition

This year we will be hosting an environmental mineralogy photo competition. Prizes will be available for some of our winning entries! The competition is open to all in EM from students to professors. Whether your photo is out in the field, under the microscope or something weird and wonderful you have found in the lab, we would love to see what you see! To enter, submit your photos alongside an explanation of what your picture is showing to emg@minersoc.org. The deadline for entry is **28th February 2025**

Here's an example from one of our committee members, showing redox features in intertidal flat sediments in the German Wadden Sea!

EMG supports speaker at European Mineralogical Conference

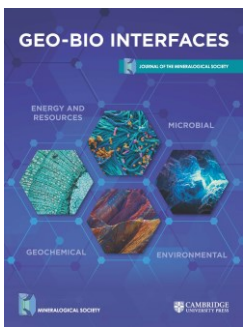
The EMG enabled the attendance at EMC2024 of Ashley King of the Natural History Museum. Ashley was the invited keynote speaker in the session: "Crystallisation of carbonates: Mechanisms, kinetics, methods, case studies, and novel applications" organized by Remi Rateau, Gabrielle Stockmann, Giuseppe Saldi, Dominique Tobler and J.D. Rodriguez-Blanco. This is the abstract for the well-attended talk which he delivered:

Tracing Fluids in the Early Solar System Using Carbonates

King, A. J., Schofield, P. F. and Russell, S.S

Asteroids are the leftover building blocks of the Solar System, providing a ~4.6-billion-year-old record of the processes and events that formed the planets. Dark, carbon-rich asteroids that accreted near or beyond the orbit of Jupiter are thought to contain water and organic matter and likely played a key role in the origin of hydrogen and prebiotic molecules on Earth. The geological history of carbon-rich asteroids can be revealed through a combination of remote observations and laboratory analysis of returned samples and meteorites, with carbonate minerals particularly sensitive tracers of fluid compositions and the timescales of fluid-rock reactions in the early Solar System……

Visit https://www.minersoc.org/6843-2.html to read the full book of abstracts from the EMC2024 conference!



Geo-Bio Interfaces Journal

Geo-Bio Interfaces, is a new official journal of the Mineralogical Society that has released its first volume this year, published in Cambridge University Press. The journal covers four key areas, bringing together the geo- and biosciences: microbial, environmental, geochemical, and energy and resources. As a gold open access journal, Geo-Bio Interfaces provides a platform for accessible peer-reviewed research including publishing research articles, reviews, and rapid communications. For further details, visit https://www.cambridge.org/core/journals/geo-bio-interfaces

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Joint Research In Progress Meeting with RSC Radiochemistry

The EMG-RSC Radiochemistry Joint Research in Progress (RiP) Meeting was a resounding success, bringing together researchers from various UK institutions and career stages. The meeting covered a range of topics, including radioactive and non-radioactive contaminated land, geological disposal of radioactive waste, and mining. The keynote talk by Prof Claire Corkhill covered the intersection of environmental mineralogy and radiochemistry, highlighting how naturally occurring minerals can inform radioactive waste disposal!

The joint nature of the meeting allowed for fruitful discussions between researchers from both groups, fostering knowledge exchange and collaboration. The optional meal provided an excellent opportunity for networking in a relaxed setting. Despite some last-minute schedule changes, the online attendance option worked seamlessly, ensuring inclusivity for all participants.

The meeting was free for all attendees, thanks to financial support from Nuclear Waster Services and the National Nuclear Laboratory. Prizes were awarded to recognize outstanding student presentations and posters. We look forward to our next RIP to build on the fantastic success from this year!

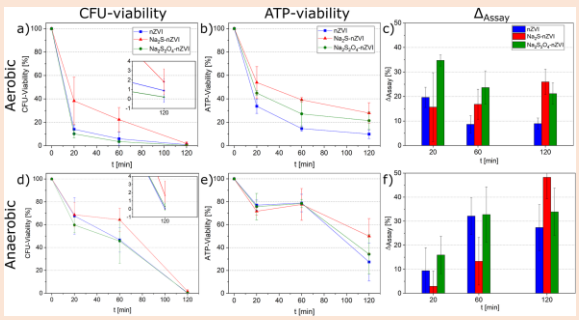
Read the full report: https://www.minersoc.org/emg-rip-2024.html

Publications

Research Highlight

Bacterial toxicity of sulfidated nanoscale zerovalent iron in aerobic and anaerobic systems: implications for chlorinated solvent clean-up strategies

In this work, published in Geo-Bio Interfaces, Adrian Schiefler and team demonstrate the impact of sulfidation of nZVI on bacterial toxicity in the context of water dechlorination. Two forms of sulfidated nZVI, (from Na_2S and $Na_2S_2O_4$) were compared with regular nZVI when exposed to a strain of Shewenella Oneidensis to determine biotoxicity. The study found that the sulfidation of nZVI, particularly with Na_2S as the precursor, showed a reduction in colony inactivation during early exposure and indicates that sulfidated nZVI allows for faster recovery of bacterial dichlorination properties.



https://doi.org/10.1016/j.cej.2023.147049

New Publications

- A disposal-MOX concept for plutonium disposition https://doi.org/10.1039/D4MA00420E
- Microbial hydrogen sinks in the sand-bentonite backfill material for the deep geological disposal of radioactive waste https://doi.org/10.3389/fmicb.2024.1359677
- Adsorption of Neodymium, Dysprosium, and Ytterbium to Goethite under Varying Aqueous Chemistry Conditions https://doi.org/10.1021/acsearthspacechem.4c00032
- Redox Dynamic Interactions of Arsenic(III) with Green Rust Sulfate in the Presence of Citrate https://pubs.acs.org/doi/10.1021/acs.estlett.4c00700
- Magnetite nanoparticles are metastable biogeobatteries in consecutive redox cycles driven by microbial Fe oxidation and reduction https://doi.org/10.1180/gbi.2024.2

If you would like your (or a colleague's) publication featured in the Environmental Mineralogy Explorer newsletter don't hesitate to drop us a line at: EMG@minersoc.org