

[View this email in your browser](#)



RAWMINA Project Newsletter #6

Building an integrated, innovative pilot system for
recovery of critical raw materials from mine waste

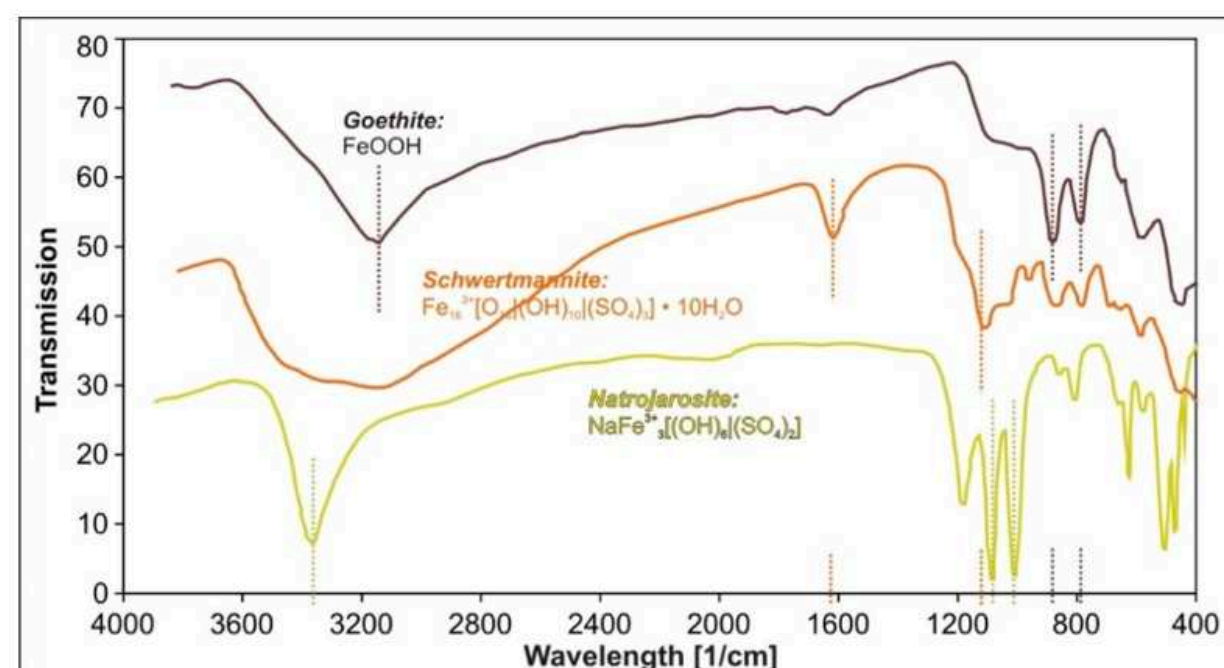


Project News

How to separate iron from a microbiological
leaching solution in addition to critical elements
and produce valuable by-products in the process

In the RAWMINA project, the critical metals antimony and cobalt are bound to sulphide minerals as trace elements in processing residues from copper extraction, so-called flotation tailings. There are microorganisms that are able to dissolve these sulphides, such as pyrite (FeS_2) or chalcopyrite (CuFeS_2), which are present in the secondary raw materials (tailings). As iron is the main metal in these sulphides, a technology is required to separate the high iron and low antimony and cobalt concentrations. This is done by downstream processes utilising the different chemical-physical properties and serves the aim of recovering as many of the valuable materials contained in the tailings as possible.

After microbiological leaching of sulphidic flotation tailings from the Tharsis deposit, a solution was obtained which, in addition to 20 - 45 g/L iron, 60 g/L sulphates, also contained 300 mg/L copper, 200 mg/L arsenic, 30 mg/L cobalt, 10 mg/L antimony, 600 mg/L calcium and organic substances of the biomass. The pH value was determined to be 0.8 - 1.5.



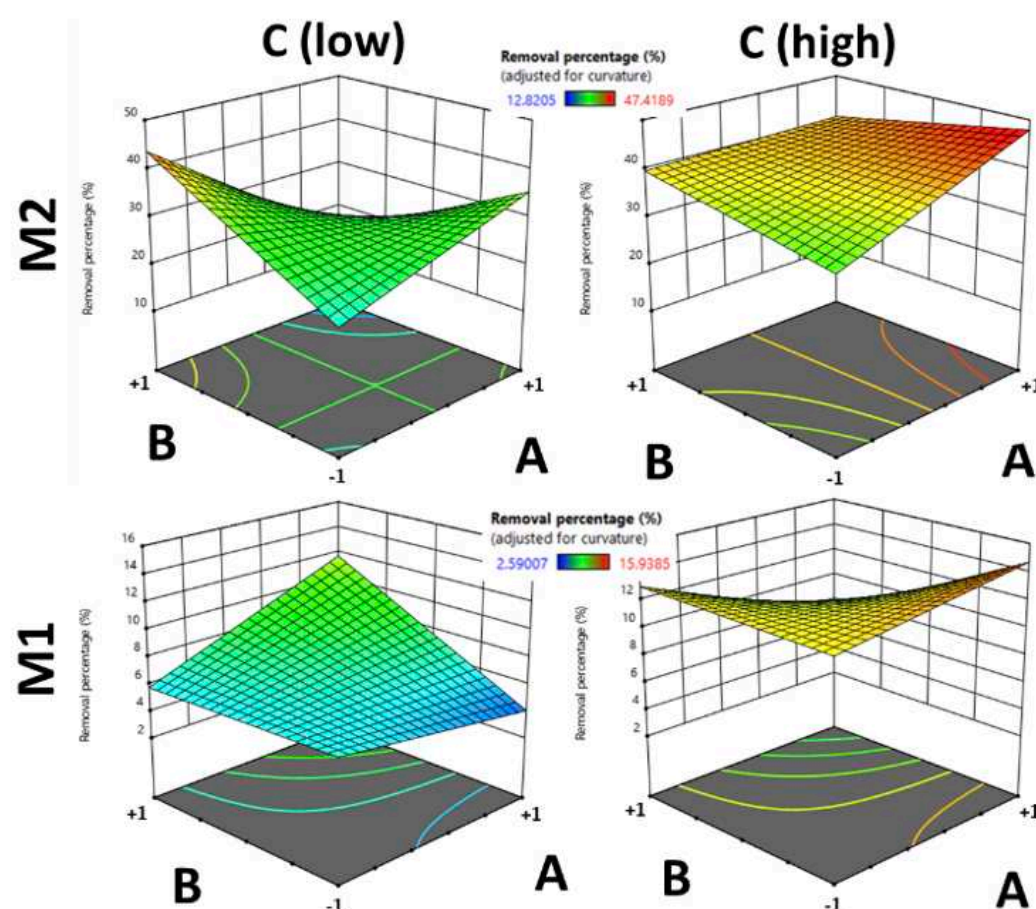
To enable the separation of iron from the pregnant leaching solution, a technological idea first had to be developed. Therefore, a concept for a multi-stage process was developed to enable the highest possible recovery of all usable contents.

Continue to read the full article [here](#).

Desorption of target Critical Raw Materials from Nanofibrous Composite Materials

Article by RAWMINA partners **Roberto Boada**, **Iris H. Valido**, **Gustavo Pérez** from the **Universitat Autònoma de Barcelona (UAB)**

nanocomposite adsorbent materials have been developed to selectively adsorb those elements. To be able to reuse the absorbed elements it is necessary to desorb them from the nanocomposite material (NCM). The traditional desorbing methodologies require the use of high concentrated strong acid or bases which increase the cost of the process and produces large amount of chemical waste. Controlling the thermodynamics of the adsorption and desorption processes is an alternative to desorb these elements decreasing the use of chemicals.



The application of Design of Experiments (DoE) methodology is used for the optimization of the thermal-desorption process (TDP), which provides a greener desorption alternative while achieving a fast and efficient metal recovery. This methodology has been applied to the desorption of Co and Sb from metal organic frameworks (MOFs) embedded in nanofibers. Metal-organic frameworks (MOFs) are porous materials built by combining metal cluster ions and organic linkers. To achieve high desorption yields, the different combinations of the most influencing factors were assessed. Since testing systematically how each of these parameter influences the desorption consumes time and MOF material, a DoE based on a two-levels factorial design (23) has been used to perform a preliminary screening on the best adsorbing MOFs to determine the optimal desorption condition. The DoE methodology has allowed us to decrease the number of experiments to be performed from 81 to 27 (considering 3 replicates for statistical purposes). Design-Expert software was used for the DoE design and data treatment. Results have revealed that this methodology is the most appropriate to improve the desorption process and to improve the recovery efficiency.

Continue to read the full article [here](#).

In case you missed us

RAWMINA Consortium and Review Meeting @ G.E.O.S, Freiberg, Germany

June 2024



RAWMINA's 36-month consortium and review meeting, hosted by G.E.O.S. Ingenieurgesellschaft mbH, took place in Freiberg, Germany. During two days in June 2024, the consortium reviewed progress over the past months and set the stage for the second project review meeting, in which the project received positive feedback from reviewers and project officer. The consortium is delighted that RAWMINA continues to achieve remarkable success. Together, we are making significant strides towards pioneering innovation in CRM recovery.

RAWMINA Pilot Plant @ CLC, Seville, Spain

June 2024



RAWMINA is entering its piloting phase, and we are currently trialling innovative technologies for extracting critical metals from mine waste at Cobre Las Cruces' (CLC) facilities in Seville, Spain. These technologies aim to recover valuable metals such as cobalt, tungsten, gold, and silver. One of the key methods being tested is bioleaching, a process that uses microorganisms to extract metals from rocks. CLC's pilot plant, built in 2016 for its polymetallic refinery project, will serve as the testing ground for these technologies.

RAWMINA @ MMH, Seville, Spain

October 2024



The RAWMINA project partners from Leitat Technological Center, AGQ Labs, and the University of Seville showcased our project at the Mining and Minerals Hall (MMH) in Seville, Spain. The MMH brings together the mining sector worldwide, to discuss technological innovations implemented in all the processes of exploration, extraction, production and treatment of mineral raw materials.

RAWMINA Final Conference





The RAWMINA Final Conference took place on October 22nd and 23rd, hosted at the Casa de la Convalescència in Barcelona. During these two days, discussions revolved around the latest advancements and strategies in CRM recovery, emphasizing the importance of sustainable practices and innovation in securing the supply of these vital resources. This event was made possible through the dedicated collaboration of the entire RAWMINA team, and we extend our sincere gratitude to all participants, including members of the RAWMINA consortium as well as representatives from other relevant projects and organizations.

Diego Morillo, the project coordinator, shared his appreciation following the conference: "After a few days of reflecting on the event, I would like to thank all attendees for their participation and contributions during these two remarkable days. All speakers demonstrated a high level of expertise on critical raw materials and provided insightful presentations and engaging discussions during the roundtables. I'd also like to highlight the active participation in the brokerage session, which I hope will lead to fruitful collaborations in the future. Events like these not only promote the innovations developed through our projects but also underscore the essential role of innovation in the mining sector and the need to adopt new processes for progress."

The RAWMINA team will now embark in the final stages of the project with more results and insights to share in the coming months.

In the meantime, we will release a post-event video, featuring interviews with representatives from across the project's value chain, highlighting our work on the recovery and revalorization of critical raw materials.

Stay tuned!

Interested in Raw Minerals Innovation?

Raw Minerals Open Innovation Helix



Critical Raw Materials (CRMs) are crucial to Europe's economy, and for the green and digital transitions. They form a strong industrial base, producing a broad range of goods and applications, both current and future.

Research into sustainable, reliable and resilient sources of CRMs and transfer of process technologies into use has never been more important.

Our members are currently targeting opportunities under Cluster 4 of Horizon Europe, seeking international collaborations relevant to the Raw Minerals community

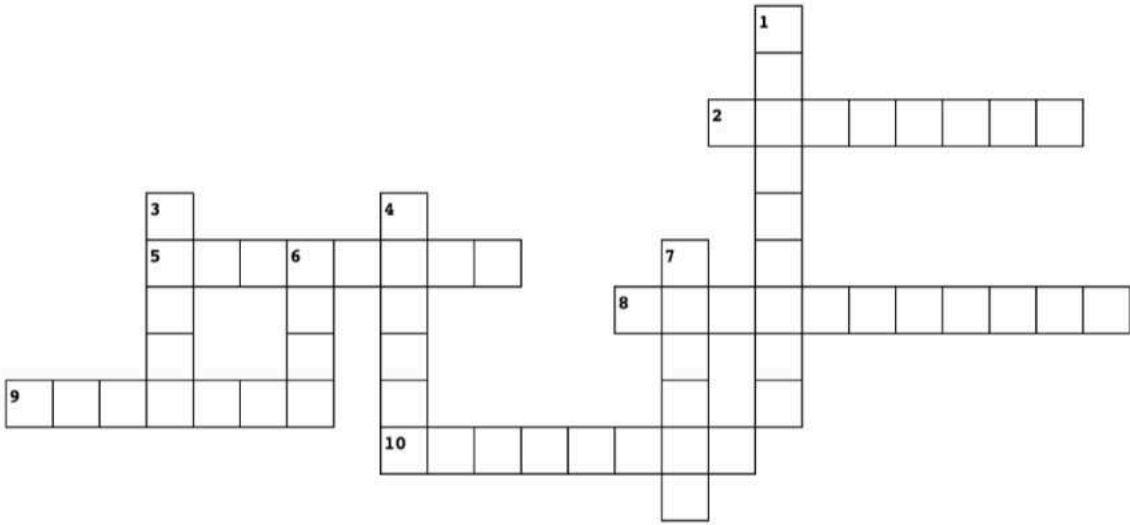
Our community of researchers, technologists, innovators and policy makers continue to be active on the Crowdhelix platform. [Join free as an individual stakeholder from the link on the Helix page!](#) [Organisational memberships are required for some functions].

Visit and join the Helix!

Try your hand at the RAWMINA crossword

To end this newsletter, we'd like to invite you to enjoy a bit of geological trivia fun - the RAWMINA crossword 😊

Print Share Edit ■ Answers ≡



Across

2. CRM refers to what type of Raw Materials? (8 letters)
5. A silver-coloured, brittle element, used extensively in the electronics industry. (8 letters)
8. The RAWMINA project has received funding from this European Union research and innovation programme. (7 letters, 4 numbers)
9. The RAWMINA project focuses on mines and minerals representative of this peninsula. (7 letters)

Down

1. The first element in the periodic table named after a country. (9 letters)
3. Part of RAWMINA's mine waste valorisation aims is to recycle up to 90% of this precious resource. (5 letters)
4. Essential element for ensuring longer life span of batteries. (6 letters)
6. RAWMINA focuses on removing this mineral by means of magnetic separation. (4 letters)
7. Chile has the world's largest deposits of this mineral ore. (6 letters)

Play

All the answers to the crossword can be found on the RAWMINA project website.



The RAWMINA project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 958252.



Our mailing address is:

Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe](#)

