

## **Biomining '23**

**Title:** Bioleaching process development and optimization to recover critical raw materials from sulfidic mining wastes

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### **Abstract:**

Bioleaching of sulfidic mine wastes from the Iberian pyrite belt was studied in the framework of the H2020 project RAWMINA to recover critical raw materials and to remove sulfides. The study focused on the process development and optimization, and on the understanding of the mechanisms involved. Bioleaching tests were performed using a microbial consortium (*Leptospirillum ferriphilum*, *Acidithiobacillus caldus* and *Sulfobacillus* spp.) in 2-L stirred tank reactors (STRs) maintained at 42 °C at different operating conditions (solid content, pH control and CO<sub>2</sub>-enrichment of the gas phase). Main results showed good recovery of Co (~100%), Cu (75%) and Sb (~50%), little effect of CO<sub>2</sub> gas enrichment on the microbial growth and a negative influence of low pH (< 1) on iron oxidation kinetics. Then, two continuous STRs in series (total volume of 6-L) were used to test the optimized operating conditions. This test also allowed increasing microorganisms' resistance to low-pH.