IMWA 2026
Jeongseon

International Mine Water Association Conference

5–10 July 2026 | Jeongseon, South Korea

Conference Agenda

Overview and details of the sessions of this Congress. Please select a date or location to show only sessions at that day or location. Please select a single session for a detailed view (with abstracts and downloads if available). The programme is preliminary and subject to change!

Please note that all times are shown in the time zone of the conference. **The current conference time is: 17th Nov 2026, 10:15:45pm KST**

To register for the Conference, please navigate to www.IMWA2026.info/registration.

Daily Overview

Session

S22 - Circular Economy in Mine Waste and Water Management

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Time: **Thursday, 09/July/2026: 4:10pm - 5:30pm**
Session Chair: **Carmen Mihaela Neculita**

Location: **Sapphire**

5th floor, 111 people (for classroom type)

Presentations

***Treatment of simulated copper-zinc-bearing acid mine drainage using scrap-derived aluminum–iron bimetals and implications for downstream metal recovery**

Dayle Tranz Dano[1], Ilhwan Park[1], Mayumi Ito[1], Carlito Tabelin[2], Vannie Joy Resabal[2]
1: Hokkaido University, Japan; 2: Mindanao State University - Iligan Institute of Technology, Philippines

Acid mine drainage (AMD) has historically been treated as an environmental liability requiring perpetual management. Yet the very metals that make AMD hazardous also position it as an underutilized secondary resource for critical metals such as copper (Cu) and zinc (Zn), whose sustainable supply is increasingly uncertain given depletion of primary ores and rising demand from metal-intensive green technologies. Most existing recovery technologies applied to AMD, however, rely on costly laboratory-grade reagents and complex equipment, undermining the sustainability and economic feasibility of a circular approach.

This study introduces a cost-effective and sustainable strategy for AMD treatment with implications for downstream critical-metal recovery, using Al–Fe bimetallic materials derived from recycled aluminum scrap filings. The bimetals were synthesized via a modified cementation method using Al scrap filings as precursor, and characterized by XRF, SEM-EDS, and XPS, confirming successful deposition of Fe—including zero-valent species (Fe^0, Al^0)—on the Al surface. Batch experiments demonstrated high metal removal efficacy, achieving ~100% Cu and ~98% Zn removal from simulated AMD (pH ~2.1; 10.4 mg/L Cu, 7.4 mg/L Zn) within 20–-120 minutes at 5–20 g/L bimetal dosage. Mechanistic evaluation, supported by post-reaction SEM-EDS and XPS analysis, confirms that metal capture proceeds primarily via electrochemical reduction to Cu^0 and Zn^0 through galvanic interactions and direct reduction, accompanied by secondary adsorption/co-precipitation onto in-situ formed Al/Fe oxyhydroxides for Zn. Crucially, the Al–Fe bimetal simultaneously raised solution pH to ~5.7 without the introduction of neutralizing reagents, highlighting its dual role in AMD valorization and treatment. Preliminary recyclability tests indicate that complete Cu removal is sustained over five cycles, while Zn removal declines as deposited Cu and corrosion layers progressively mask the reactive Al^0/Fe^0 sites at the bimetal surface.

This work establishes a waste-valorization methodology that transforms two distinct waste streams—scrap aluminum and metal-rich AMD—into a concentrated metal-laden bimetal substrate amenable to downstream recovery. By coupling efficient metal capture with concurrent self-neutralization in a single low-cost reactive medium, the approach offers a scalable pathway for integrated AMD remediation. The kinetic window between Cu and Zn and their distinct surface speciation further inform two specific downstream recovery pathways: a contact-time-based selectivity lever that exploits the faster reduction of Cu for sequential Cu/Zn loading, and leaching schemes tailored to the distinct surface forms—metallic Cu^0 deposits on one hand, and mixed Zn^0/Zn(II) phases co-precipitated with Al/Fe oxyhydroxides on the other—providing concrete groundwork for circular critical-metal supply chains.

Dano_Treatment of simulated copper-zinc-bearing acid mine drainage using scrap-derived_1149.docx

***Revalorization of coal waste facilities: The CRMsDataSpace EU Approach**

Hernan Flores[1,5], Bastian Reker[1], Tansel Dogan[1], Antonio Marquez[2], Alicja Krzemień[3], Vlad Mihai Păsculescu[4]
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Europe's coal mining legacy is often viewed as an environmental burden, yet closed coal waste facilities may also represent overlooked secondary sources of critical raw materials. The CRMsDataSpace project responds to this challenge by developing a harmonized European data infrastructure to assess CRM potential in closed extractive coal waste facilities. This paper

presents the project framework, pilot sites in Germany, Spain, Romania and Poland, and the German case study of iron-rich mine water treatment sludge from the former Ibbenbüren coalfield. It shows how standardized data and material characterization can support more transparent revalorization strategies for post-mining regions.

Flores_Revalorization of coal waste facilities_1158.docx

Exploring the effects of seawater use in Cu-Ni-PGM flotation against recycled mine water

Malibongwe Shadrach Manono[1], **Lisa Louise October**[2], **Kirsten Claire Corin**[1]

1: University of Cape Town, South Africa; 2: University of the Witwatersrand

Water scarcity remains a critical constraint for mining operations in semi-arid regions such as Southern Africa, where the platinum group metals (PGM) industry is highly dependent on water-intensive mineral
processing routes. Flotation circuits typically comprise 60-85% water by volume, making water quality a key determinant of both metallurgical performance and sustainable mine water management. In
response, mining operations are increasingly considering alternative water sources, including seawater and recycled mine process water. However, both water types exhibit elevated ionic strength and complex
chemistries that can significantly alter flotation behaviour. This study addresses the need to understand how contrasting mine water qualities influence flotation performance, with direct relevance to water
reuse strategies and freshwater reduction targets.

A comparative laboratory investigation was conducted using a Merensky PGM ore to evaluate flotation performance under seawater and synthetic recycled process water conditions. Batch flotation tests were
performed using the standard UCT CMR flotation protocol, complemented by two-phase and three phase froth column tests to assess froth stability. Seawater samples collected from two coastal locations
were compared against synthetic plant water representative of recycled mine water with elevated ionic strength. Key response variables included solids recovery, water recovery, froth height, and froth collapse time, and bubble size, while water chemistry was characterised in terms of ionic composition and ionic strength.

The results indicate that seawater consistently produced higher solids and water recoveries than synthetic process water, attributed primarily to its substantially higher ionic strength. Enhanced froth stability, characterised by increased froth heights and longer collapse times, was observed in seawater systems, reflecting reduced bubble coalescence and smaller bubble sizes. Recycled process water showed intermediate behaviour, with flotation response influenced by divalent ions such as Ca^{2+} and Mg^{2+}. While higher ionic strength increased mass pull, it also increased the potential for gangue entrainment, highlighting trade-offs between recovery and selectivity.

The findings demonstrate that water quality should be treated as an active metallurgical variable rather than a passive process input. This work provides evidence to support informed decision-making around seawater use, mine water recycling, and closed-loop water circuits in PGM operations as seawater has not been researched in the context of PGM ores. The study further contributes to the broader understanding of how mine-affected water chemistries influence processing performance, supporting sustainable water management strategies under increasing water scarcity

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