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Critically Missing? Exploring (Geo)Chemistry's place in Critical Minerals Education

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Critical minerals are a growing focus in Australia, with implications for industry, export, and workforce development [1]. These are areas where universities can lead through knowledge creation and mobilization, and skills training.

The critical minerals sector relies on interdisciplinary collaborations to tackle challenges around increasing mineral discovery and extraction, supporting net zero transitions, and practicing responsible resource management.

Graduates working in these teams may not be geoscientists, but may have trained in aligned disciplines. In addition to their discipline knowledge, the graduates will need grounding in the geosciences and to be conversant with the social responsibilities of resource use.

Chemistry is a key aligned discipline [2], encompassing geochemistry topics such as redox reactions, aqueous equilibria, mineral processing and refining, sustainable and green chemistry through to end-product creation.

We are interested in how current education practices utilize chemistry's potential to support geochemistry literacy and how chemistry departments can help prepare graduates for employment in the critical minerals sector.

We conducted a qualitative systematic review [3] comparing Australian public policy on critical minerals education with peer-reviewed and grey literature in the geochemical and chemical education spaces (2022–present).

Using thematic analysis, we identified where policy and practice aligned and where curriculum gaps existed. Where gaps were found, we drew on the broader geoscience education literature for examples of good practice.

Our findings address strategies for delivering geochemical content to diverse student populations and making geochemistry relevant to contemporary societal needs within a chemistry context.

This session invites audience discussion on developing evidence-based curricula to train both expert geoscientists and discipline-aligned chemists for the future workforce.

[1] Commonwealth of Australia (2023), https://www.industry.gov.au/publications/critical-minerals-strategy-2023-2030

[2] Australian Geoscience Council Inc. (2015), https://www.agc.org.au/wp-content/uploads/2018/07/geology-syllabus-agc-model.pdf

[3] Page *et al.* (2021), *BJM,* 372:n71