

Environmental Geochemistry of Heavy Metals/Metalloids and Countermeasure Strategies



Name	MUFALO Walubita	E-mail	mufalo@asakawa-nct.ac.jp
-------------	-----------------	---------------	--------------------------

Status	Project Assistant Professor
---------------	-----------------------------

Affiliations	
---------------------	--

Keywords	Environmental Geochemistry, Water–Mineral Interactions, Contaminant Transport, Remediation and Restoration, Environmental Engineering
-----------------	---

Technical	Acid Mine Drainage Assessment
------------------	-------------------------------

Support Skills	Environmental Monitoring and Countermeasure strategies Multi-Element Analysis and Bioaccessibility in Environmental compartments
-----------------------	---

Research Contents

Environmental Geochemistry of Heavy metals/Metalloids and Countermeasure Strategies

Environmental degradation from industrialization is often inevitable due to the release of toxic metals/metalloids from mine wastes, tailings, slags, mineral processing facilities or excavated rocks from tunnel construction and civil engineering works. These toxic elements, whether naturally occurring or from anthropogenic sources, can be released into the environment through acid mine or rock drainage when exposed to oxidative conditions. Metals/metalloids such as lead, zinc, cadmium, arsenic, and mercury persist in the environment, accumulating in soils and water bodies, and eventually entering the food chain. This contamination process poses significant risks to ecosystems and human health. Therefore, understanding the environmental geochemistry of these metals is crucial for effective countermeasures.

Research areas include:

1. Multi-Element Analysis: Understanding inter-element relationships in various compartments, their geochemical behavior, and implications for contamination.
2. Sources and Pathways: Examining their sources, contamination levels, and the pathways through which they enter and persist in the environment.
3. Advances in Analysis Methods: Quantifying potentially toxic elements in various environmental matrices and investigating the interactions between contaminants and soil components, including batch sorption analysis and column tests.
4. Environmental Monitoring and Countermeasure: Exploring novel countermeasure techniques and monitoring strategies to mitigate the impact of toxic metal contamination on ecosystems and human health.

Available Facilities and Equipment

UV spectrophotometer	
AAS Atomic Absorption Spectrometer	
Ion chromatography	
Fourier-transform infrared spectroscopy	