

Ortsverband Freiberg
Die Vorsitzende / Prof. Dr. Carla Vogt
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GDCh-Kolloquium am 7.1.2026

TU Bergakademie Freiberg, Lessingstraße 45

16:15 Uhr, Lessingstr. 45, LES-1001



Prof. Dr. Johanna Irrgeher

Montanuniversität Leoben, Chair of General and Analytical
Chemistry, Leoben, Austria
GDCh Fresenius Lectureship

Expanding the Elemental and Isotopic Toolbox in Support of the Sustainable Development Goals

In today's world, atomic spectroscopy plays a pivotal role in addressing global challenges and supporting the United Nations Sustainable Development Goals (SDGs), particularly those linked to environmental protection, resource efficiency, and green transformation. This talk highlights recent advances in elemental and isotopic analysis by atomic spectroscopy that expand the analytical toolbox required to tackle emerging scientific and societal questions along the full life cycle of chemical elements.

Major progress has been achieved in improving the quantification of TCEs in complex and challenging matrices such as e-waste and urban environmental samples. Projects such as MetroCycleEU (www.metrocycle.eu) and TecEUS (www.teceus.at) demonstrate how advanced ICP-MS/MS strategies enable SI-traceable, interference-free determination of TCEs in urban mine waste (e.g. LEDs, printed circuit boards, lithium-ion batteries) and in plant systems used to assess environmental exposure. These developments provide essential data to support sustainable recycling strategies, circular economy concepts, and exposure assessment in urban environments.

Complementing elemental analysis, the talk showcases significant advances in isotope ratio analysis for environmental applications. Using multi-collector ICP-MS in combination with innovative sampling approaches, such as diffusive gradients in thin films (DGT), ultra-trace isotope ratio measurements (e.g. Sr, Pb, Ba) become feasible even in highly dilute and complex matrices like rivers and seawater. Case studies from large river catchments such as the Mur river in Austria and Slovenia, the Amazon River in Brazil or the Akaki River in Ethiopia illustrate how isotope "fingerprinting" enables the discrimination of natural versus anthropogenic inputs, the identification of pollution hotspots, and the construction of aquatic isoscapes—key tools for evidence-based environmental management.

Interessenten sind herzlich willkommen!

Prof. Dr. C. Vogt
Ortsverbandsvorsitzende



GESELLSCHAFT DEUTSCHER CHEMIKER

Prof. Dr. G. Frisch
Fakultätsdekan