

金屬同位素應用於環境鑑識之潛力與展望
Applications of Metal Isotope Geochemistry in Environmental Forensics

黃國芳(K.-F. Huang)*、吳栢兆(P.-C. Wu)、李德春(D.-C. Lee)

中央研究院地球科學研究所 kfhuang@earth.sinica.edu.tw

摘要

As a result of anthropogenic activities (e.g. emissions from industrial or mining sources), cycling of metals/metalloids in the environment has played a critical role as pollutants affecting natural environments. The biogeochemical cycle of these metals/metalloids on Earth's surface is often accompanied by isotope fractionation that can now be precisely measured due to recent analytical advances. In consequence, a new research field complementing the traditional stable isotopes (H, O, N, C, and S) with many more elements across the periodic table (e.g., Li, B, Mg, Cu and Zn, refer to “non-traditional stable isotopes”; and radiogenic Sr-Nd-Pb isotopes) has emerged over the last two decades, and potentially serves as robust tracers in environmental geochemistry. In this talk, a particular focus lies on the recent developments of high-precision metal isotope measurements on the new generation High-resolution Multi-collector Inductively Coupled Plasma Mass Spectrometry, and the utility of novel metal isotopes as source/process tracers in atmospheric, aquatic and terrestrial environments. Future applications and limitations of using metal isotope signatures as tracers in environmental forensics will be further discussed.

關鍵字：

金屬同位素、高解析度多接受器感應耦合電漿質譜儀、同位素分化、環境鑑識
Metal isotope, High-resolution MC-ICP-MS, Isotope fractionation, Environmental forensics