Are metal stable isotopes a useful tracer for ecosystem processes?

CHRISTOPHE CLOQUET[1]

[1]CRPG, UMR-CNRS 7358, Nancy, 54500, France (cloquet@crpg.cnrs-nancy.fr)

Twenty years after the introduction of multicollector-ICP-MS, most of the periodic table elements have been investigated for their isotopic composition variation. Metals and metalloids stable isotopes received a particular attention and nowadays there is about 1 publication coming out per working day. If small modification of the isotope ratios are detected and accessible in various studies, largest variations were recorded in anthropogenically impacted environments and in the biological compartments.

The importance of the ecosystem in the biogeochemical cycle of the metals and particularly transition metals has been considered as negligible since long time, which is not the case anymore. We realised that the impact of the vegetation may have an important role in the geochemical cycle and this impact could be traced using metal stable isotopes.

Here, I will mainly present some of our recent investigations on Zn and Ni isotopic variation in the field and laboratory experiments. I will highlight 1) how the soil/solution-plants transfer affect Zn and Ni isotope ratios and 2) the difference existing between different plant species by using the isotope ratios variation inside the plants. I will stress on information obtained with the isotopic tool and present in which extend this tool can be used to trace processes in the ecosystem. Finally, I will try to evaluate the contribution of the ecosystem to the global biogeochemical cycle.