Application of the correspondence analysis to determine anomalous elements and samples

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Determination of the anomaly elements and samples

Based on the soil lithogeochemistry samples were taken from a probable porphyritic Cu-Au mineralized area, the mineralized elements and anomalous samples were identified [1,2,3]. For this propose, a correspondence analysis was done on a matrix of 29 elements (columns) and 149 samples (rows) from the study area. According to the correspondence analysis, a final matrix of 28 factors or variables (columns) and 29+149 labels (rows), which includes of elements and sample numbers, was calculated. The cross plots of two variables (Fig. 1 A and B) from the final matrix were confirmed Au and Cu as anomaly elements and numbers 40, 74, 22 and 84 as anomalous samples.

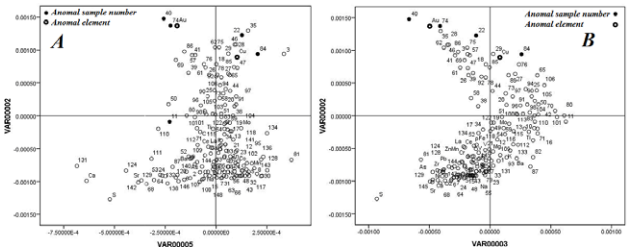

Figure 1: Correspondence analysis for identification of the anomalous element and samples

Conclusion

Identiification of the anomaly sample numbers and anomaly elements could be possible by using the correspondence analysis. The combination of this method and anomaly separation method could separate the high potential eara for follow up exploration program.

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Large-area input, inventories, and transport of ^{129}I and ^{127}I in Germany

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The environmental abundance of ^{129}I has been changed substantially, mainly as a consequence of the ^{129}I releases from European reprocessing plants. The stable ^{127}I and the long-lived ^{129}I exhibit massive disequilibria in all biotic and abiotic compartments of the environment in Western Europe. Measurements of ^{127}I and ^{129}I in some German soils revealed ^{129}I/^{127}I ratios of 10^{-7} to 10^{-10} [1, 2], whereas the ^{129}I/^{127}I ratio in a pre-nuclear Russian soil was found to be 5.7×10^{-12} [3]. Iodine from wet and dry precipitation is accumulated in soils, transported by surface waters, infiltrates groundwater, and makes its way through the biosphere. Many of the ecological pathways of iodine are still unknown.

The goal of this project is to investigate the continuous atmospheric input via dry and wet deposition, the inventories in the pedosphere and the output by river waters of ^{129}I and ^{127}I in entire Germany.

To this end, aerosol filter samples from 4 locations will be analysed, as well as precipitation samples from 10 locations, and surface water samples from 15 locations along the major rivers in Germany. Sampling is supported by DWD (German Meteorological Service), BfG (Federal Institute for Hydrology), PTB (Federal Metrology Institute), and BfS (Federal Office for Radiation Protection). Additionally, sampling of different soil types at various locations in Germany, down to a depth of 50 cm, is in progress.

Deposition rates, deposition densities and transport rates will be calculated using inductivity coupled plasma mass spectrometry (ICP-MS) and accelator mass spectrometry (AMS) as analytical tools. First results from the two-year sampling, which startet in March 2011, will be shown. A sufficiently dense grid of sampling points will allow a nation-wide mapping of the atmospheric input, the accumulation in soils, and the transport with surface waters back to the sea. Based on these data, a model will be established describing the different pathways of iodine isotopes in the environment.

[1] Ernst *et al*. (2003) *Kerntechnik* **68**(4), 155–167. [2] Daraoui *et al*. (2011) to be submitted to *J. Environ. Rad* [3] Szidat *et al*. (2000) *Nucl. Instr. Meth. Phys. Res. B* **172**, 699–710.