**Anthropogenic U-236 in Arctic and Antarctic moss and lichens**

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Above 100 uranium NdF3 alpha spectrometric sources were dissolved and prepared for U-236 analyses by means of Accelerator Mass Spectrometry (AMS) at the Vienna Environmental Research Accelerator (VERA). Original samples were mosses or lichens of different species collected in both Antarctic and Arctic polar regions: In Arctic samples were collected near sea shore during two cruises along the north-west passage in the Arctic in 2012 and 2013. The Antarctic samples were collected mostly in the Southern Shetlands area during several Polish projects in the years 2002-2015. Ten process blanks were prepared along with the environmental samplesFor the first time, uranium was directly prepared in a Fluoride matrix for the AMS measurement and U was extracted as UF5- from the ion source. The 236U/238U data set of the already intensively studied alpha sources could be obtained with minimal additional effort in sample preparations, thanks to the elevated ionization efficiencies of UF5-. In combination with the results of previous extensive studies on the mosses and lichens samples by alpha spectrometry or ICP-MS for 238U, 239+240Pu or 239Pu, it was possible to evaluate isotopic ratios such as 236U/239Pu atom ratio. .

Both ratios: 236U/238U and 236U/239Pu reveal asymmetric distributions. The arithmetic mean values more than double medians (for 236U/238U it is 3.23E-07 and 1.28E-07, respectively, whereas for example in case of atom ratios for 236U/239Pu it is 0.213 and 0.102, respectively). The spread for 236U/238U atom ratio is bigger, from 6.61E(-09) to 7.36E(-06), due to higher maximum value. The mean uncertainty is order of magnitude smaller that mean values so the relative typical uncertainty was close to 10%. In case of 236U/239Pu atom ratio the range covers two orders of magnitude, from 0.009 to 0.891. The mean uncertainty is 0.040 what is nearly 19% of mean result.

Comparison of all corresponding atom ratios observed for Arctic and Antarctic samples reveal that all ratios are about twice times lower for Antarctic than for Arctic samples.

Proposed here normalization of 236U to 239Pu (as either atom or activity ratio) seems to be useful despite additional efforts paid for Pu analyses. Such normalization is based on the assumption that fractionation between Pu and U isotopes from fallout can be neglected.

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