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The Determination of Radiostrontium, Cs-Isotopes and Pu-Isotopes in Tyrolean Foodstuff and Environmental Samples

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In case of emergency situations a specific sampling plan exists in Austria. During regular emergency exercises, samples are taken according to this sampling plan. Thus, during an emergency exercise in Tyrol, various foodstuffs and the environment were sampled. Therefore, these samples were taken into account for the determination of Pu-239/240, Sr-90, Cs-134 and Cs-137. Surface water, raw milk, radish, leeks, kohlrabi and feedstuff were part of the analyzed samples. These samples can be used to give additional data to the Austrian monitoring program conducted according to the commission recommendation 2000/473/Euratom. The analytical method used in this project was a combined approach for the simultaneous determination of Sr-90 and Pu-isotopes. It was based on the selective separation by ion exchange chromatography (DOWEX®) and extraction chromatography (Eichrom Sr-Resin) followed by liquid scintillation counting for Sr-90 and alpha spectrometry for the Pu-isotopes. The counting sources for the alpha spectrometric measurements were prepared by coprecipitation using Nd as carrier. In order to monitor the chemical recovery of the analytes Pu-242 and natural Sr-86/88 were added as tracers. Whereas the Pu-242 tracer was measured in the end by alpha spectrometry, the content of the Sr-tracer was monitored by ICP-MS. Using this separation method good chemical yields for Sr of about 90% and for Pu above 70% were observed. Further results of this project will be presented at the conference. This project was funded by the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology.

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