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Testing automatic groundwater sampling unit by the isotope analytical and dissolved ion tests

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Automatic water sampling unit was developed in Herteleni Laboratory of Environmental Studies of MTA ATOMKI for monitoring the radioactive emission from nuclear facilities into the groundwater. The efficiency of existing and renewed geometry units and the reproducibility of survey data have been examined in the course of this work. A testing method was developed for this purpose, and ion binding efficiencies of ion exchange resins were analysed for different ion concentrations. These efficiencies have to be taken into consideration when we estimate the amount of the contamination got into the groundwater on the basis of the proportion of ions gained back from the resin. The model tests were executed under controlled laboratory circumstances. These circumstances were tried to be formed into facts true to nature.

It has been found during the chain of tests that the sampling unit is suitable for well reproducible sampling. It can be told that all tested geometrical lay-outs are utilizable and work with proper efficiency in small/low range of concentration as well. Taking the different efficiencies into consideration the activities can be corrected in the case of every element if it is necessary. A correcting factor should be introduced during the ^{14}C anion exchanging sampling because samples taken by exchanging have systematically lower radio carbon content than the reality has. We are working on continuing the tests. The gamma activity measurement of existing gained back cation samples and giving the exact value of ^{14}C correction can give more reliable picture and direction to developing existing and possibly new systems.

Primary author: JANOVIKS, Róbert (Institute of Nuclear Research of the HAS, Debrecen, Hungary)

Co-authors: SOMOGYI, István (Iontech Ltd, Litér, Hungary); Dr BRAUN, Mihály (University of Debrecen, Hungary); Dr MOLNÁR, Mihály (Institute of Nuclear Research of the HAS, Debrecen, Hungary); VERES, Mihály (Isotoptech Co. Ltd., Debrecen, Hungary); Dr STEFÁNKA, Zsolt (Institute of Isotopes, Budapest, Hungary); BI-HARI, Árpád (Institute of Nuclear Research of the HAS, Debrecen, Hungary)

Presenter: JANOVIKS, Róbert (Institute of Nuclear Research of the HAS, Debrecen, Hungary)

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