

Efficiency of ion exchange columns for precipitation sampling

As a complement to measurement of radioactivity in air, collection and measurement of radioactivity in deposition is performed within many national surveillance systems. Deposited radioactivity can give an estimate of external dose to the public and can also be used to calculate transport factors for radionuclides. The system used in Sweden consists of a collection funnel, from which the precipitation is passed through an ion-exchange column. The contents of the column is ashed and measured by gamma spectroscopy to determine deposited radioactivity. In order to have control of the method used within the national surveillance system, and a possible future modification of the method, the collection efficiency of the ion exchange columns has been investigated together with test of a new ion exchange resin. The effects of ashing at different temperatures has also been investigated for the two types of ion exchange columns. The collection efficiency was shown to be high for all tested nuclides. For most nuclides the loss during ashing were small, but loss of iodine could be seen at as low temperature as 60°C. Deposition of Ru-106 during autumn 2017 revealed that activity can remain in the funnel and lead to cross-contamination of subsequent samples.

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