

EVALUATION OF UNCERTAINTY IN ^{239}Pu MEASUREMENT IN BILBERRY BY ALPHA-PARTICLE SPECTROMETRY AND LOW-LEVEL LSS

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This paper reports the qualification of measurement uncertainties associated with the results of activity concentration of ^{239}Pu in bilberry by α -particle spectrometry and low level liquid scintillation spectrometry (LSS). The plutonium on earth is an anthropogenic element being created within the past seven decades by human activities involving fissionable materials. Determination of activity concentrations of plutonium isotopes in the environment at trace and ultra-trace levels with high accuracy and high precision is very important for monitoring of the human pollution especially following a nuclear accident [1].

The measurement of radioactivity via any radiometric techniques should be performed with sufficient accuracy and realistic measurement uncertainty to obtain valid result with high accuracy and high precision. The measurement uncertainty is an essential part of the assessment of the measurement result [2]. Recently, more attention is given to the evaluation of the measurement uncertainty and to the preparation of uncertainty budget. However, there is no common procedure for the estimation of a realistic uncertainty.

In this study, a procedure for evaluation of the measurement uncertainties for ^{239}Pu analysis by α -particle spectrometry and liquid scintillation spectrometry was investigated and the steps in the analytical procedure that contribute considerably to the combined measurement uncertainty were identified.

References

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