Radium analisys Ra-226, Ra-228 - STUK

Radium

Measurement	Liquid scintillation counting Gamma Spectrometry
Method used for matrices	Environmental Water Terrestrial Air (particles) Biological Foodstuff Industrial products Swipe filters
Separation Method	No separation
Radionuclide(s)	Ra-226 Ra-228
Quantity of sample used (in kg, I,)	0.04 for Ra-226, 2L for Ra-228 (water)
Counting time for the method	3 hours for Ra-226, 16 hours for Ra-228
MDA of the technique	0.00004 Bq/sample for Ra-226, 0.14 Bq/sample for Ra-228
FWHM (Energy MeV)	-
Method Evaluated	No
Method Accredited	Yes
Procedure	

Radium (Ra-226)

Ra-226 activity is calculated from the gross alpha spectrum of the basis of the counts measured in window set on the area of Po-214 peak. This will give quite accurate results to Ra-226 because no other natural or artificial radionuclides have alpha emissions on the same energy range. The counting efficiency of Po-214 (and thus of Ra-226) in the selected window is between 80 - 86%. The lower limit of detection for Ra-226 is 0.01 Bq/l at 95% confidence level for 0.038 litre water and 180 minute counting.

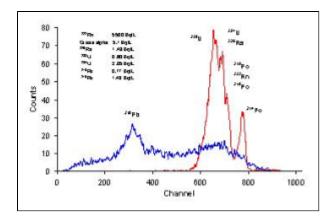


Figure. Gross alpha spectrum of water sample. Ra-226 is calclulated based on Po-214 peak.

Radium (Ra-228)

Ra-228 is determined via its daughter nuclide Ac-228 using gamma spectrometric measurement. Water sample (1-2 litres) is evaporated to volume of 0.5 litres after which it is transferred into counting container (Marinelli).

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