Intercomparison exercise 2A

Exercise with self-absorption, true coincidence corrections (TCC) and relative geometries

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The exercise 2A contains 9 spectra without energy and efficiency information.

Description of the spectra

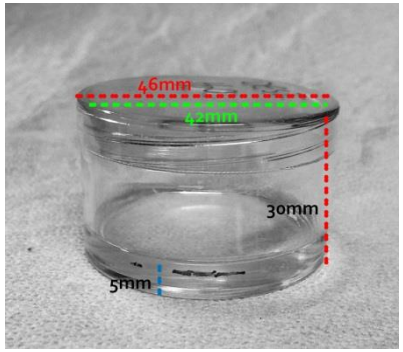
File name	Info
2017NKS_calibration_0546.chn	Calibration file for efficiency calibration. Geometry 5mm diameter 46mm
2017NKS_background.chn	Background empty chamber with teflon holder on top of detector
2017NKS_energy_CoCsAmNa.chn	Point sources ^{241}Am , ^{137}Cs, ^{22}Na, ^{60}Co for energy calibration
2017NKS_Ra_H2O_0546.chn	Reference for self-absorption correction. ^{226}Ra point source on top of vial with outer diameter of 46mm filled to a height of 5mm with distilled water.
2017NKS_Ra_sampB_0546.chn	Sample for analysis with ^{226}Ra point source on top. Geometry, 5mm height, 46 mm diameter
2017NKS_sampB_0546.chn	Sample for analysis. Geometry: 5mm height, 46 mm diameter
2017NKS_Ra_sampA_1077.chn	Efficiency transfer sample with ^{226}Ra point source. Geometry: 10mm height, 77mm diameter
2017NKS_sampA_1077.chn	Efficiency transfer sample for analyze. Geometry: 10mm height, 77 mm diameter
2017NKS_Ra_H2O_1077.chn	Reference for self-absorption correction. ^{226}Ra point source on top of vial with size outer diameter 77mm filled to a height of 10mm with distilled water.

Four spectra for calculating the self-absorption correction using a Ra-226 point source.

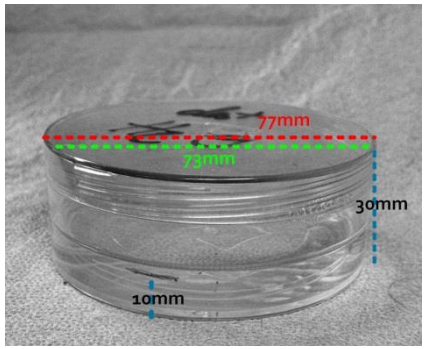
Data included in the exercise

- Calibration Certificate Table
- Detector Data from the producer
- Tower shielding Data
- Geometry data for sample containers

- Two efficiency spectra.
- One with known nuclide data for calculating the geometry efficiency and one with geometry data for computing the new efficiency



Geometry 42mm diameter with data for calculating the energy/peak shape/efficiency



Geometry 73mm diameter box has no data for the efficiency

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The participants had to calibrate for one geometry and do the sample analyses for that, and use the data from the calibration certificate.

Additionally, we made 2 more spectra with a different geometry. The participants had to do an efficiency transfer for the new geometry with help off the data from the detector setup.

Results

Radionuclide	Sample A		Sample B	
	Activity [Bq]	Uncertainty [%]	Activity [Bq]	Uncertainty [%]
K-40	≤ 1,25		0,54	24,05
Ba-133	14,03	2,69	14,45	2,66
Tl-208	0,17	17,02	0,03	31,30
Pb-212	0,46	5,76	0,06	15,47
Bi-214	4,83	3,93	10,19	3,38
Pb-214	4,72	4,43	10,04	4,28
Ra-226	8,27	5,97	18,99	2,94
Ac-228	10,88	3,51	1,83	4,46