



Characteristics

- EFFTRAN [1] is not a full Monte Carlo code, makes use of approximations
- aimed at use in an environmental laboratory, not in an NMI
- a collection of Fortran modules linked to an Excel user interface
- meant to be fast, so that routine use is possible
- can be incorporated into a LIMS
- available free of charge, source code is included
- downloaded by some 400 labs from around the globe
- validated through international intercomparisons [2, 3], used in the IAEA and JRC courses

Method

- total efficiencies calculated by Monte Carlo integration (ray tracing), no scattering considered [1]
- the LS-curve calculated at the same time [4, 5]
- scattering on the sample added using a model [6]
- peak-to-total values calculated by solving an integral equation to get the FEPE
- efficiencies multiplied with the LS-factor
- the calculation then proceeds the same way as for a point source (Andreev formulae) [7]
- decay data from the KORDATEN database [8]
- attenuation factors from the XCOM database [9]
- one average K X-ray and one average L X-Ray considered

Results

Comparison with GESPECOR results from an earlier study

Nuclide	E [keV]	Detector A				Detector B			
		Point	Water	Filter	Soil	Point	Water	Filter	Soil
Co-60	1173	0.6	0.4	0.2	0.4	-0.3	0.2	-0.2	0.0
	1333	0.6	0.4	0.2	0.4	-0.3	0.2	-0.2	0.1
Ba-133	53	-1.4	0.8	0.1	0.1	-2.6	3.2	-0.3	3.0
	80	-2.8	0.1	-1.2	-0.6	-5.9	2.9	-1.7	2.3
	81	-1.1	0.5	-0.3	0.0	-2.5	1.7	-0.8	1.5
	276	-2.7	-0.5	-1.5	-0.7	-3.8	3.1	-0.8	3.7
	303	-2.0	-0.4	-1.1	-0.6	-3.1	2.4	-0.9	3.2
	356	-1.6	-0.4	-0.9	-0.5	-2.6	1.4	-1.1	2.0
	384	-1.1	-0.4	-0.8	-0.4	-2.0	0.1	-1.6	0.9
CS-134	475	0.6	1.1	0.4	1.0	-0.8	1.0	-0.2	0.5
	563	0.5	1.2	0.3	1.0	-1.1	0.9	-0.4	0.4
	569	0.7	1.2	0.5	1.1	-0.9	1.0	-0.3	0.6
	605	0.4	0.6	0.2	0.5	-0.5	0.5	-0.2	0.1
	796	0.3	0.6	0.1	0.5	-0.6	0.4	-0.3	0.1
	802	0.6	1.0	0.3	0.9	-0.8	0.9	-0.2	0.5
	1039	-0.1	0.0	-0.7	-0.2	-0.1	0.1	-0.7	-0.1
	1168	-0.2	-0.6	-1.4	-0.7	1.0	-0.3	-0.9	-0.1
	1365	0.1	-0.7	-1.7	-0.9	2.0	-0.3	-0.6	0.0
Na-22	1274	0.4	1.0	-0.1	1.1	-1.4	1.0	-0.7	0.6

References

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