

Pipeline and Hazardous Materials Safety Admin., DOT

§ 173.435

Where:

n + m represents all the radionuclides in the mixture;
 m are the radionuclides that do not need to be considered;

$a_{(i)}$ is the activity of radionuclide i in the mixture; and
 $A_{(i)}$ is the A_1 or A_2 value, as appropriate for radionuclide i.

(h) Tables 7 and 8 are as follows:

TABLE 7—GENERAL VALUES FOR A_1 AND A_2

Radioactive contents	A_1		A_2	
	(TBq)	(Ci)	(TBq)	(Ci)
1. Only beta or gamma emitting nuclides are known to be present	1×10^{-1}	2.7×10^0	2×10^{-2}	5.4×10^{-1}
2. Only alpha emitting nuclides are known to be present	2×10^{-1}	5.4×10^0	9×10^{-5}	2.4×10^{-3}
3. No relevant data are available	1×10^{-3}	2.7×10^{-2}	9×10^{-5}	2.4×10^{-3}

TABLE 8—GENERAL EXEMPTION VALUES

Radioactive contents	Activity concentration for exempt material		Activity limits for exempt consignments	
	(Bq/g)	(Ci/g)	(Bq)	(Ci)
1. Only beta or gamma emitting nuclides are known to be present	1×10^1	2.7×10^{-10}	1×10^4	2.7×10^{-7}
2. Only alpha emitting nuclides are known to be present	1×10^{-1}	2.7×10^{-12}	1×10^3	2.7×10^{-8}
3. No relevant data are available	1×10^{-1}	2.7×10^{-12}	1×10^3	2.7×10^{-8}

[69 FR 3677, Jan. 26, 2004; 69 FR 55119, Sept. 13, 2004]

§ 173.434 Activity-mass relationships for uranium and natural thorium.

The table of activity-mass relationships for uranium and natural thorium are as follows:

Thorium and uranium enrichment ¹ (Wt% ²³⁵ U present)	Specific activity			
	TBq/gram	Grams/Tbq	Ci/gram	Grams/Ci
0.45 (depleted)	1.9×10^{-8}	5.4×10^7	5.0×10^{-7}	2.0×10^6
0.72 (natural)	2.6×10^{-8}	3.8×10^7	7.1×10^{-7}	1.4×10^6
1.0	2.8×10^{-8}	3.6×10^7	7.6×10^{-7}	1.3×10^6
1.5	3.7×10^{-8}	2.7×10^7	1.0×10^{-6}	1.0×10^6
5.0	1.0×10^{-7}	1.0×10^7	2.7×10^{-6}	3.7×10^5
10.0	1.8×10^{-7}	5.6×10^6	4.8×10^{-6}	2.1×10^5
20.0	3.7×10^{-7}	2.7×10^6	1.0×10^{-5}	1.0×10^5
35.0	7.4×10^{-7}	1.4×10^6	2.0×10^{-5}	5.0×10^4
50.0	9.3×10^{-7}	1.1×10^6	2.5×10^{-5}	4.0×10^4
90.0	2.1×10^{-6}	4.7×10^5	5.8×10^{-5}	1.7×10^4
93.0	2.6×10^{-6}	3.9×10^5	7.0×10^{-5}	1.4×10^4
95.0	3.4×10^{-6}	3.0×10^5	9.1×10^{-5}	1.1×10^4
Natural thorium	8.1×10^{-9}	1.2×10^8	2.2×10^{-7}	4.6×10^6

¹ The figures for uranium include representative values for the activity of uranium-234 which is concentrated during the enrichment process. The activity for thorium includes the equilibrium concentration of thorium-228.

[Amdt. 173-244, 60 FR 50307, Sept. 28, 1995, as amended by 63 FR 52849, Oct. 1, 1998]

§ 173.435 Table of A_1 and A_2 values for radionuclides.

The table of A_1 and A_2 values for radionuclides is as follows:

Symbol of radionuclide	Element and atomic number	A_1 (TBq)	A_1 (Ci) ^b	A_2 (TBq)	A_2 (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Ac-225 (a)	Actinium (89)	8.0×10^{-1}	2.2×10^1	6.0×10^{-3}	1.6×10^{-1}	2.1×10^3	5.8×10^4
Ac-227 (a) .....	.....	9.0×10^{-1}	2.4×10^1	9.0×10^{-5}	2.4×10^{-3}	2.7	7.2×10^1
Ac-228 .....	.....	6.0×10^{-1}	1.6×10^1	5.0×10^{-1}	1.4×10^1	8.4×10^4	2.2×10^6
Ag-105	Silver (47)	2.0	5.4×10^1	2.0	5.4×10^1	1.1×10^3	3.0×10^4
Ag-108m (a) .....	.....	7.0×10^{-1}	1.9×10^1	7.0×10^{-1}	1.9×10^1	9.7×10^{-1}	2.6×10^1
Ag-110m (a) .....	.....	4.0×10^{-1}	1.1×10^1	4.0×10^{-1}	1.1×10^1	1.8×10^2	4.7×10^3
Ag-111 .....	.....	2.0	5.4×10^1	6.0×10^{-1}	1.6×10^1	5.8×10^3	1.6×10^5
Al-26	Aluminum (13)	1.0×10^{-1}	2.7	1.0×10^{-1}	2.7	7.0×10^{-4}	1.9×10^{-2}

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Am-241	Americium (95)	1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	1.3×10 ⁻¹	3.4
Am-242m (a)		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	3.6×10 ⁻¹	1.0×10 ¹
Am-243 (a)		5.0	1.4×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	7.4×10 ⁻³	2.0×10 ⁻¹
Ar-37	Argon (18)	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	3.7×10 ³	9.9×10 ⁴
Ar-39		4.0×10 ¹	1.1×10 ³	2.0×10 ¹	5.4×10 ²	1.3	3.4×10 ¹
Ar-41		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.5×10 ⁶	4.2×10 ⁷
As-72	Arsenic (33)	3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	6.2×10 ⁴	1.7×10 ⁶
As-73		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	8.2×10 ²	2.2×10 ⁴
As-74		1.0	2.7×10 ¹	9.0×10 ⁻¹	2.4×10 ¹	3.7×10 ³	9.9×10 ⁴
As-76		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	5.8×10 ⁴	1.6×10 ⁶
As-77		2.0×10 ¹	5.4×10 ²	7.0×10 ⁻¹	1.9×10 ¹	3.9×10 ⁴	1.0×10 ⁶
At-211 (a)	Astatine (85)	2.0×10 ¹	5.4×10 ²	5.0×10 ⁻¹	1.4×10 ¹	7.6×10 ⁴	2.1×10 ⁶
Au-193	Gold (79)	7.0	1.9×10 ²	2.0	5.4×10 ¹	3.4×10 ⁴	9.2×10 ⁵
Au-194		1.0	2.7×10 ¹	1.0	2.7×10 ¹	1.5×10 ⁴	4.1×10 ⁵
Au-195		1.0×10 ¹	2.7×10 ²	6.0	1.6×10 ²	1.4×10 ²	3.7×10 ³
Au-198		1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	9.0×10 ³	2.4×10 ⁵
Au-199		1.0×10 ¹	2.7×10 ²	6.0×10 ⁻¹	1.6×10 ¹	7.7×10 ³	2.1×10 ⁵
Ba-131 (a)	Barium (56)	2.0	5.4×10 ¹	2.0	5.4×10 ¹	3.1×10 ³	8.4×10 ⁴
Ba-133		3.0	8.1×10 ¹	3.0	8.1×10 ¹	9.4	2.6×10 ²
Ba-133m		2.0×10 ¹	5.4×10 ²	6.0×10 ⁻¹	1.6×10 ¹	2.2×10 ⁴	6.1×10 ⁵
Ba-140 (a)		5.0×10 ⁻¹	1.4×10 ¹	3.0×10 ⁻¹	8.1	2.7×10 ³	7.3×10 ⁴
Be-7	Beryllium (4)	2.0×10 ¹	5.4×10 ²	2.0×10 ¹	5.4×10 ²	1.3×10 ⁴	3.5×10 ⁵
Be-10		4.0×10 ¹	1.1×10 ³	6.0×10 ⁻¹	1.6×10 ¹	8.3×10 ⁻⁴	2.2×10 ⁻²
Bi-205	Bismuth (83)	7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	1.5×10 ³	4.2×10 ⁴
Bi-206		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	3.8×10 ³	1.0×10 ⁵
Bi-207		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	1.9	5.2×10 ¹
Bi-210		1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	4.6×10 ³	1.2×10 ⁵
Bi-210m (a)		6.0×10 ⁻¹	1.6×10 ¹	2.0×10 ⁻²	5.4×10 ⁻¹	2.1×10 ⁻⁵	5.7×10 ⁻⁴
Bi-212 (a)		7.0×10 ⁻¹	1.9×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	5.4×10 ⁵	1.5×10 ⁷
Bk-247	Berkelium (97)	8.0	2.2×10 ²	8.0×10 ⁻⁴	2.2×10 ⁻²	3.8×10 ⁻²	1.0
Bk-249 (a)		4.0×10 ¹	1.1×10 ³	3.0×10 ⁻¹	8.1	6.1×10 ¹	1.6×10 ³
Br-76	Bromine (35)	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	9.4×10 ⁴	2.5×10 ⁶
Br-77		3.0	8.1×10 ¹	3.0	8.1×10 ¹	2.6×10 ⁴	7.1×10 ⁵
Br-82		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁴	1.1×10 ⁶
C-11	Carbon (6)	1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.1×10 ⁷	8.4×10 ⁸
C-14		4.0×10 ¹	1.1×10 ³	3.0	8.1×10 ¹	1.6×10 ⁻¹	4.5
Ca-41	Calcium (20)	Unlimited	Unlimited	Unlimited	Unlimited	3.1×10 ⁻³	8.5×10 ⁻²
Ca-45		4.0×10 ¹	1.1×10 ³	1.0	2.7×10 ¹	6.6×10 ²	1.8×10 ⁴
Ca-47 (a)		3.0	8.1×10 ¹	3.0×10 ⁻¹	8.1	2.3×10 ⁴	6.1×10 ⁵
Cd-109	Cadmium (48)	3.0×10 ¹	8.1×10 ²	2.0	5.4×10 ¹	9.6×10 ¹	2.6×10 ³
Cd-113m		4.0×10 ¹	1.1×10 ³	5.0×10 ⁻¹	1.4×10 ¹	8.3	2.2×10 ²
Cd-115 (a)		3.0	8.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.9×10 ⁴	5.1×10 ⁵
Cd-115m		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	9.4×10 ²	2.5×10 ⁴
Ce-139	Cerium (58)	7.0	1.9×10 ²	2.0	5.4×10 ¹	2.5×10 ²	6.8×10 ³
Ce-141		2.0×10 ¹	5.4×10 ²	6.0×10 ⁻¹	1.6×10 ¹	1.1×10 ³	2.8×10 ⁴
Ce-143		9.0×10 ⁻¹	2.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.5×10 ⁴	6.6×10 ⁵
Ce-144 (a)		2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	1.2×10 ²	3.2×10 ³
Cf-248	Californium (98)	4.0×10 ¹	1.1×10 ³	6.0×10 ⁻³	1.6×10 ⁻¹	5.8×10 ¹	1.6×10 ³
Cf-249		3.0	8.1×10 ¹	8.0×10 ⁻⁴	2.2×10 ⁻²	1.5×10 ⁻¹	4.1
Cf-250		2.0×10 ¹	5.4×10 ²	2.0×10 ⁻³	5.4×10 ⁻²	4.0	1.1×10 ²
Cf-251		7.0	1.9×10 ²	7.0×10 ⁻⁴	1.9×10 ⁻²	5.9×10 ⁻²	1.6
Cf-252 (h)		5.0×10 ⁻²	1.4	3.0×10 ⁻³	8.1×10 ⁻²	2.0×10 ¹	5.4×10 ²
Cf-253 (a)		4.0×10 ¹	1.1×10 ³	4.0×10 ⁻²	1.1	1.1×10 ³	2.9×10 ⁴
Cf-254		1.0×10 ⁻³	2.7×10 ⁻²	1.0×10 ⁻³	2.7×10 ⁻²	3.1×10 ²	8.5×10 ³
Cl-36	Chlorine (17)	1.0×10 ¹	2.7×10 ²	6.0×10 ⁻¹	1.6×10 ¹	1.2×10 ⁻³	3.3×10 ⁻²
Cl-38		2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	4.9×10 ⁶	1.3×10 ⁸
Cm-240	Curium (96)	4.0×10 ¹	1.1×10 ³	2.0×10 ⁻²	5.4×10 ⁻¹	7.5×10 ²	2.0×10 ⁴
Cm-241		2.0	5.4×10 ¹	1.0	2.7×10 ¹	6.1×10 ²	1.7×10 ⁴
Cm-242		4.0×10 ¹	1.1×10 ³	1.0×10 ⁻²	2.7×10 ⁻¹	1.2×10 ²	3.3×10 ³
Cm-243		9.0	2.4×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	1.9	5.2×10 ¹
Cm-244		2.0×10 ¹	5.4×10 ²	2.0×10 ⁻³	5.4×10 ⁻²	3.0	8.1×10 ¹
Cm-245		9.0	2.4×10 ²	9.0×10 ⁻⁴	2.4×10 ⁻²	6.4×10 ⁻³	1.7×10 ⁻¹
Cm-246		9.0	2.4×10 ²	9.0×10 ⁻⁴	2.4×10 ⁻²	1.1×10 ⁻²	3.1×10 ⁻¹
Cm-247 (a)		3.0	8.1×10 ¹	1.0×10 ⁻³	2.7×10 ⁻²	3.4×10 ⁻⁶	9.3×10 ⁻⁵
Cm-248		2.0×10 ⁻²	5.4×10 ⁻¹	3.0×10 ⁻⁴	8.1×10 ⁻³	1.6×10 ⁻⁴	4.2×10 ⁻³
Co-55	Cobalt (27)	5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	1.1×10 ⁵	3.1×10 ⁶
Co-56		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.1×10 ³	3.0×10 ⁴
Co-57		1.0×10 ¹	2.7×10 ²	1.0×10 ¹	2.7×10 ²	3.1×10 ²	8.4×10 ³
Co-58		1.0	2.7×10 ¹	1.0	2.7×10 ¹	1.2×10 ³	3.2×10 ⁴
Co-58m		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	2.2×10 ⁵	5.9×10 ⁶
Co-60		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	4.2×10 ¹	1.1×10 ³
Cr-51	Chromium (24)	3.0×10 ¹	8.1×10 ²	3.0×10 ¹	8.1×10 ²	3.4×10 ³	9.2×10 ⁴

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Cs-129	Cesium (55)	4.0	1.1×10 ²	4.0	1.1×10 ²	2.8×10 ⁴	7.6×10 ⁵
Cs-131		3.0×10 ¹	8.1×10 ²	3.0×10 ¹	8.1×10 ²	3.8×10 ³	1.0×10 ⁵
Cs-132		1.0	2.7×10 ¹	1.0	2.7×10 ¹	5.7×10 ³	1.5×10 ⁵
Cs-134		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	4.8×10 ¹	1.3×10 ³
Cs-134m		4.0×10 ¹	1.1×10 ³	6.0×10 ⁻¹	1.6×10 ¹	3.0×10 ⁵	8.0×10 ⁶
Cs-135		4.0×10 ¹	1.1×10 ³	1.0	2.7×10 ¹	4.3×10 ⁻⁵	1.2×10 ⁻³
Cs-136		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	2.7×10 ³	7.3×10 ⁴
Cs-137 (a)		2.0	5.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.2	8.7×10 ¹
Cu-64	Copper (29)	6.0	1.6×10 ²	1.0	2.7×10 ¹	1.4×10 ⁵	3.9×10 ⁶
Cu-67		1.0×10 ¹	2.7×10 ²	7.0×10 ⁻¹	1.9×10 ¹	2.8×10 ⁴	7.6×10 ⁵
Dy-159	Dysprosium (66)	2.0×10 ¹	5.4×10 ²	2.0×10 ¹	5.4×10 ²	2.1×10 ²	5.7×10 ³
Dy-165		9.0×10 ⁻¹	2.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.0×10 ⁵	8.2×10 ⁶
Dy-166 (a)		9.0×10 ⁻¹	2.4×10 ¹	3.0×10 ⁻¹	8.1	8.6×10 ³	2.3×10 ⁵
Er-169	Erbium (68)	4.0×10 ¹	1.1×10 ³	1.0	2.7×10 ¹	3.1×10 ³	8.3×10 ⁴
Er-171		8.0×10 ⁻¹	2.2×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	9.0×10 ⁴	2.4×10 ⁶
Eu-147	Europium (63)	2.0	5.4×10 ¹	2.0	5.4×10 ¹	1.4×10 ³	3.7×10 ⁴
Eu-148		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	6.0×10 ²	1.6×10 ⁴
Eu-149		2.0×10 ¹	5.4×10 ²	2.0×10 ¹	5.4×10 ²	3.5×10 ²	9.4×10 ³
Eu-150 (short lived)		2.0	5.4×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	6.1×10 ⁴	1.6×10 ⁶
Eu-150 (long lived)		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	6.1×10 ⁴	1.6×10 ⁶
Eu-152		1.0	2.7×10 ¹	1.0	2.7×10 ¹	6.5	1.8×10 ²
Eu-152m		8.0×10 ⁻¹	2.2×10 ¹	8.0×10 ⁻¹	2.2×10 ¹	8.2×10 ⁴	2.2×10 ⁶
Eu-154		9.0×10 ⁻¹	2.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	9.8	2.6×10 ²
Eu-155		2.0×10 ¹	5.4×10 ²	3.0	8.1×10 ¹	1.8×10 ¹	4.9×10 ²
Eu-156		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	2.0×10 ³	5.5×10 ⁴
F-18	Fluorine (9)	1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.5×10 ⁶	9.5×10 ⁷
Fe-52 (a)	Iron (26)	3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	2.7×10 ⁵	7.3×10 ⁶
Fe-55		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	8.8×10 ¹	2.4×10 ³
Fe-59		9.0×10 ⁻¹	2.4×10 ¹	9.0×10 ⁻¹	2.4×10 ¹	1.8×10 ³	5.0×10 ⁴
Fe-60 (a)		4.0×10 ¹	1.1×10 ³	2.0×10 ⁻¹	5.4	7.4×10 ⁻⁴	2.0×10 ⁻²
Ga-67	Gallium (31)	7.0	1.9×10 ²	3.0	8.1×10 ¹	2.2×10 ⁴	6.0×10 ⁵
Ga-68		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	1.5×10 ⁶	4.1×10 ⁷
Ga-72		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.1×10 ⁵	3.1×10 ⁶
Gd-146 (a)	Gadolinium (64)	5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	6.9×10 ²	1.9×10 ⁴
Gd-148		2.0×10 ¹	5.4×10 ²	2.0×10 ⁻³	5.4×10 ⁻²	1.2	3.2×10 ¹
Gd-153		1.0×10 ¹	2.7×10 ²	9.0	2.4×10 ²	1.3×10 ²	3.5×10 ³
Gd-159		3.0	8.1×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.9×10 ⁴	1.1×10 ⁶
Ge-68 (a)	Germanium (32)	5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	2.6×10 ²	7.1×10 ³
Ge-71		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	5.8×10 ³	1.6×10 ⁵
Ge-77		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.3×10 ⁵	3.6×10 ⁶
Hf-172 (a)	Hafnium (72)	6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	4.1×10 ¹	1.1×10 ³
Hf-175		3.0	8.1×10 ¹	3.0	8.1×10 ¹	3.9×10 ²	1.1×10 ⁴
Hf-181		2.0	5.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	6.3×10 ²	1.7×10 ⁴
Hf-182		Unlimited	Unlimited	Unlimited	Unlimited	8.1×10 ⁻⁶	2.2×10 ⁻⁴
Hg-194 (a)	Mercury (80)	1.0	2.7×10 ¹	1.0	2.7×10 ¹	1.3×10 ⁻¹	3.5
Hg-195m (a)		3.0	8.1×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	1.5×10 ⁴	4.0×10 ⁵
Hg-197		2.0×10 ¹	5.4×10 ²	1.0×10 ¹	2.7×10 ²	9.2×10 ³	2.5×10 ⁵
Hg-197m		1.0×10 ¹	2.7×10 ²	4.0×10 ⁻¹	1.1×10 ¹	2.5×10 ⁴	6.7×10 ⁵
Hg-203		5.0	1.4×10 ²	1.0	2.7×10 ¹	5.1×10 ²	1.4×10 ⁴
Ho-166	Holmium (67)	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	2.6×10 ⁴	7.0×10 ⁵
Ho-166m		6.0×10 ⁻¹	1.6×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	6.6×10 ⁻²	1.8
I-123	Iodine (53)	6.0	1.6×10 ²	3.0	8.1×10 ¹	7.1×10 ⁴	1.9×10 ⁶
I-124		1.0	2.7×10 ¹	1.0	2.7×10 ¹	9.3×10 ³	2.5×10 ⁵
I-125		2.0×10 ¹	5.4×10 ²	3.0	8.1×10 ¹	6.4×10 ²	1.7×10 ⁴
I-126		2.0	5.4×10 ¹	1.0	2.7×10 ¹	2.9×10 ³	8.0×10 ⁴
I-129		Unlimited	Unlimited	Unlimited	Unlimited	6.5×10 ⁻⁶	1.8×10 ⁻⁴
I-131		3.0	8.1×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	4.6×10 ³	1.2×10 ⁵
I-132		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	3.8×10 ⁵	1.0×10 ⁷
I-133		7.0×10 ⁻¹	1.9×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	4.2×10 ⁴	1.1×10 ⁶
I-134		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	9.9×10 ⁵	2.7×10 ⁷
I-135 (a)		6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.3×10 ⁵	3.5×10 ⁶
In-111	Indium (49)	3.0	8.1×10 ¹	3.0	8.1×10 ¹	1.5×10 ⁴	4.2×10 ⁵
In-113m		4.0	1.1×10 ²	2.0	5.4×10 ¹	6.2×10 ⁵	1.7×10 ⁷
In-114m (a)		1.0×10 ¹	2.7×10 ²	5.0×10 ⁻¹	1.4×10 ¹	8.6×10 ²	2.3×10 ⁴
In-115m		7.0	1.9×10 ²	1.0	2.7×10 ¹	2.2×10 ⁵	6.1×10 ⁶
Ir-189 (a)	Iridium (77)	1.0×10 ¹	2.7×10 ²	1.0×10 ¹	2.7×10 ²	1.9×10 ³	5.2×10 ⁴
Ir-190		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	2.3×10 ³	6.2×10 ⁴
Ir-192 (c)		1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.4×10 ²	9.2×10 ³
Ir-194		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	3.1×10 ⁴	8.4×10 ⁵
K-40	Potassium (19)	9.0×10 ⁻¹	2.4×10 ¹	9.0×10 ⁻¹	2.4×10 ¹	2.4×10 ⁻⁷	6.4×10 ⁻⁶
K-42		2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	2.2×10 ⁵	6.0×10 ⁶
K-43		7.0×10 ⁻¹	1.9×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.2×10 ⁵	3.3×10 ⁶

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Kr-81	Krypton (36)	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	7.8×10 ⁻⁴	2.1×10 ⁻²
Kr-85		1.0×10 ¹	2.7×10 ²	1.0×10 ¹	2.7×10 ²	1.5×10 ¹	3.9×10 ²
Kr-85m		8.0	2.2×10 ²	3.0	8.1×10 ¹	3.0×10 ⁵	8.2×10 ⁶
Kr-87		2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	1.0×10 ⁶	2.8×10 ⁷
La-137	Lanthanum (57)	3.0×10 ¹	8.1×10 ²	6.0	1.6×10 ²	1.6×10 ⁻³	4.4×10 ⁻²
La-140		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	2.1×10 ⁴	5.6×10 ⁵
Lu-172	Lutetium (71)	6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	4.2×10 ³	1.1×10 ⁵
Lu-173		8.0	2.2×10 ²	8.0	2.2×10 ²	5.6×10 ¹	1.5×10 ³
Lu-174		9.0	2.4×10 ²	9.0	2.4×10 ²	2.3×10 ¹	6.2×10 ²
Lu-174m		2.0×10 ¹	5.4×10 ²	1.0×10 ¹	2.7×10 ²	2.0×10 ²	5.3×10 ³
Lu-177		3.0×10 ¹	8.1×10 ²	7.0×10 ⁻¹	1.9×10 ¹	4.1×10 ³	1.1×10 ⁵
Mg-28 (a)	Magnesium (12)	3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	2.0×10 ⁵	5.4×10 ⁶
Mn-52	Manganese (25)	3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.6×10 ⁴	4.4×10 ⁵
Mn-53		Unlimited	Unlimited	Unlimited	Unlimited	6.8×10 ⁻⁵	1.8×10 ⁻³
Mn-54		1.0	2.7×10 ¹	1.0	2.7×10 ¹	2.9×10 ²	7.7×10 ³
Mn-56		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	8.0×10 ⁵	2.2×10 ⁷
Mo-93	Molybdenum (42)	4.0×10 ¹	1.1×10 ³	2.0×10 ¹	5.4×10 ²	4.1×10 ⁻²	1.1
Mo-99 (a) (i)		1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.8×10 ⁴	4.8×10 ⁵
N-13	Nitrogen (7)	9.0×10 ⁻¹	2.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	5.4×10 ⁷	1.5×10 ⁹
Na-22	Sodium (11)	5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	2.3×10 ²	6.3×10 ³
Na-24		2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	3.2×10 ⁵	8.7×10 ⁶
Nb-93m	Niobium (41)	4.0×10 ¹	1.1×10 ³	3.0×10 ¹	8.1×10 ²	8.8	2.4×10 ²
Nb-94		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	6.9×10 ⁻³	1.9×10 ⁻¹
Nb-95		1.0	2.7×10 ¹	1.0	2.7×10 ¹	1.5×10 ³	3.9×10 ⁴
Nb-97		9.0×10 ⁻¹	2.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	9.9×10 ⁵	2.7×10 ⁷
Nd-147	Neodymium (60)	6.0	1.6×10 ²	6.0×10 ⁻¹	1.6×10 ¹	3.0×10 ³	8.1×10 ⁴
Nd-149		6.0×10 ⁻¹	1.6×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	4.5×10 ⁵	1.2×10 ⁷
Ni-59	Nickel (28)	Unlimited	Unlimited	Unlimited	Unlimited	3.0×10 ⁻³	8.0×10 ⁻²
Ni-63		4.0×10 ¹	1.1×10 ³	3.0×10 ¹	8.1×10 ²	2.1	5.7×10 ¹
Ni-65		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	7.1×10 ⁵	1.9×10 ⁷
Np-235	Neptunium (93)	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	5.2×10 ¹	1.4×10 ³
Np-236 (short-lived)		2.0×10 ¹	5.4×10 ²	2.0	5.4×10 ¹	4.7×10 ⁻⁴	1.3×10 ⁻²
Np-236 (long-lived)		9.0×10 ⁰	2.4×10 ²	2.0×10 ⁻²	5.4×10 ⁻¹	4.7×10 ⁻⁴	1.3×10 ⁻²
Np-237		2.0×10 ¹	5.4×10 ²	2.0×10 ⁻³	5.4×10 ⁻²	2.6×10 ⁻⁵	7.1×10 ⁻⁴
Np-239		7.0	1.9×10 ²	4.0×10 ⁻¹	1.1×10 ¹	8.6×10 ³	2.3×10 ⁵
Os-185	Osmium (76)	1.0	2.7×10 ¹	1.0	2.7×10 ¹	2.8×10 ²	7.5×10 ³
Os-191		1.0×10 ¹	2.7×10 ²	2.0	5.4×10 ¹	1.6×10 ³	4.4×10 ⁴
Os-191m		4.0×10 ¹	1.1×10 ³	3.0×10 ¹	8.1×10 ²	4.6×10 ⁴	1.3×10 ⁶
Os-193		2.0	5.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.0×10 ⁴	5.3×10 ⁵
Os-194 (a)		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.1×10 ¹	3.1×10 ²
P-32	Phosphorus (15)	5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	1.1×10 ⁴	2.9×10 ⁵
P-33		4.0×10 ¹	1.1×10 ³	1.0	2.7×10 ¹	5.8×10 ³	1.6×10 ⁵
Pa-230 (a)	Protactinium (91)	2.0	5.4×10 ¹	7.0×10 ⁻²	1.9	1.2×10 ³	3.3×10 ⁴
Pa-231		4.0	1.1×10 ²	4.0×10 ⁻⁴	1.1×10 ⁻²	1.7×10 ⁻³	4.7×10 ⁻²
Pa-233		5.0	1.4×10 ²	7.0×10 ⁻¹	1.9×10 ¹	7.7×10 ²	2.1×10 ⁴
Pb-201	Lead (82)	1.0	2.7×10 ¹	1.0	2.7×10 ¹	6.2×10 ⁴	1.7×10 ⁶
Pb-202		4.0×10 ¹	1.1×10 ³	2.0×10 ¹	5.4×10 ²	1.2×10 ⁻⁴	3.4×10 ⁻³
Pb-203		4.0	1.1×10 ²	3.0	8.1×10 ¹	1.1×10 ⁴	3.0×10 ⁵
Pb-205		Unlimited	Unlimited	Unlimited	Unlimited	4.5×10 ⁻⁶	1.2×10 ⁻⁴
Pb-210 (a)		1.0	2.7×10 ¹	5.0×10 ⁻²	1.4	2.8	7.6×10 ¹
Pb-212 (a)		7.0×10 ⁻¹	1.9×10 ¹	2.0×10 ⁻¹	5.4	5.1×10 ⁴	1.4×10 ⁶
Pd-103 (a)	Palladium (46)	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	2.8×10 ³	7.5×10 ⁴
Pd-107		Unlimited	Unlimited	Unlimited	Unlimited	1.9×10 ⁻⁵	5.1×10 ⁻⁴
Pd-109		2.0	5.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	7.9×10 ⁴	2.1×10 ⁶
Pm-143	Promethium (61)	3.0	8.1×10 ¹	3.0	8.1×10 ¹	1.3×10 ²	3.4×10 ³
Pm-144		7.0×10 ⁻¹	1.9×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	9.2×10 ¹	2.5×10 ³
Pm-145		3.0×10 ¹	8.1×10 ²	1.0×10 ¹	2.7×10 ²	5.2	1.4×10 ²
Pm-147		4.0×10 ¹	1.1×10 ³	2.0	5.4×10 ¹	3.4×10 ¹	9.3×10 ²
Pm-148m (a)		8.0×10 ⁻¹	2.2×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	7.9×10 ²	2.1×10 ⁴
Pm-149		2.0	5.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.5×10 ⁴	4.0×10 ⁵
Pm-151		2.0	5.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.7×10 ⁴	7.3×10 ⁵
Po-210	Polonium (84)	4.0×10 ¹	1.1×10 ³	2.0×10 ⁻²	5.4×10 ⁻¹	1.7×10 ²	4.5×10 ³
Pr-142	Praseodymium (59)	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	4.3×10 ⁴	1.2×10 ⁶
Pr-143		3.0	8.1×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.5×10 ³	6.7×10 ⁴
Pt-188 (a)	Platinum (78)	1.0	2.7×10 ¹	8.0×10 ⁻¹	2.2×10 ¹	2.5×10 ³	6.8×10 ⁴
Pt-191		4.0	1.1×10 ²	3.0	8.1×10 ¹	8.7×10 ³	2.4×10 ⁵
Pt-193		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	1.4	3.7×10 ¹
Pt-193m		4.0×10 ¹	1.1×10 ³	5.0×10 ⁻¹	1.4×10 ¹	5.8×10 ³	1.6×10 ⁵
Pt-195m		1.0×10 ¹	2.7×10 ²	5.0×10 ⁻¹	1.4×10 ¹	6.2×10 ³	1.7×10 ⁵
Pt-197		2.0×10 ¹	5.4×10 ²	6.0×10 ⁻¹	1.6×10 ¹	3.2×10 ⁴	8.7×10 ⁵
Pt-197m		1.0×10 ¹	2.7×10 ²	6.0×10 ⁻¹	1.6×10 ¹	3.7×10 ⁵	1.0×10 ⁷
Pu-236	Plutonium (94)	3.0×10 ¹	8.1×10 ²	3.0×10 ⁻³	8.1×10 ⁻²	2.0×10 ¹	5.3×10 ²

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Pu-237		2.0×10 ¹	5.4×10 ²	2.0×10 ¹	5.4×10 ²	4.5×10 ²	1.2×10 ⁴
Pu-238		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	6.3×10 ⁻¹	1.7×10 ¹
Pu-239		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	2.3×10 ⁻³	6.2×10 ⁻²
Pu-240		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	8.4×10 ⁻³	2.3×10 ⁻¹
Pu-241 (a)		4.0×10 ¹	1.1×10 ³	6.0×10 ⁻²	1.6	3.8	1.0×10 ²
Pu-242		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	1.5×10 ⁻⁴	3.9×10 ⁻³
Pu-244 (a)		4.0×10 ⁻¹	1.1×10 ¹	1.0×10 ⁻³	2.7×10 ⁻²	6.7×10 ⁻⁷	1.8×10 ⁻⁵
Ra-223 (a)	Radium (88)	4.0×10 ⁻¹	1.1×10 ¹	7.0×10 ⁻³	1.9×10 ⁻¹	1.9×10 ³	5.1×10 ⁴
Ra-224 (a)		4.0×10 ⁻¹	1.1×10 ¹	2.0×10 ⁻²	5.4×10 ⁻¹	5.9×10 ³	1.6×10 ⁵
Ra-225 (a)		2.0×10 ⁻¹	5.4	4.0×10 ⁻³	1.1×10 ⁻¹	1.5×10 ³	3.9×10 ⁴
Ra-226 (a)		2.0×10 ⁻¹	5.4	3.0×10 ⁻³	8.1×10 ⁻²	3.7×10 ⁻²	1.0
Ra-228 (a)		6.0×10 ⁻¹	1.6×10 ¹	2.0×10 ⁻²	5.4×10 ⁻¹	1.0×10 ¹	2.7×10 ²
Rb-81	Rubidium (37)	2.0	5.4×10 ¹	8.0×10 ⁻¹	2.2×10 ¹	3.1×10 ⁵	8.4×10 ⁶
Rb-83 (a)		2.0	5.4×10 ¹	2.0	5.4×10 ¹	6.8×10 ²	1.8×10 ⁴
Rb-84		1.0	2.7×10 ¹	1.0	2.7×10 ¹	1.8×10 ³	4.7×10 ⁴
Rb-86		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	3.0×10 ³	8.1×10 ⁴
Rb-87		Unlimited	Unlimited	Unlimited	Unlimited	3.2×10 ⁻⁹	8.6×10 ⁻⁸
Rb(nat)		Unlimited	Unlimited	Unlimited	Unlimited	6.7×10 ⁶	1.8×10 ⁸
Re-184	Rhenium (75)	1.0	2.7×10 ¹	1.0	2.7×10 ¹	6.9×10 ²	1.9×10 ⁴
Re-184m		3.0	8.1×10 ¹	1.0	2.7×10 ¹	1.6×10 ²	4.3×10 ³
Re-186		2.0	5.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	6.9×10 ³	1.9×10 ⁵
Re-187		Unlimited	Unlimited	Unlimited	Unlimited	1.4×10 ⁻⁹	3.8×10 ⁻⁸
Re-188		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	3.6×10 ⁴	9.8×10 ⁵
Re-189 (a)		3.0	8.1×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.5×10 ⁴	6.8×10 ⁵
Re(nat)		Unlimited	Unlimited	Unlimited	Unlimited	0.0	2.4×10 ⁻⁸
Rh-99	Rhodium (45)	2.0	5.4×10 ¹	2.0	5.4×10 ¹	3.0×10 ³	8.2×10 ⁴
Rh-101		4.0	1.1×10 ²	3.0	8.1×10 ¹	4.1×10 ¹	1.1×10 ³
Rh-102		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	4.5×10 ¹	1.2×10 ³
Rh-102m		2.0	5.4×10 ¹	2.0	5.4×10 ¹	2.3×10 ²	6.2×10 ³
Rh-103m		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	1.2×10 ⁶	3.3×10 ⁷
Rh-105		1.0×10 ¹	2.7×10 ²	8.0×10 ⁻¹	2.2×10 ¹	3.1×10 ⁴	8.4×10 ⁵
Rn-222 (a)	Radon (86)	3.0×10 ⁻¹	8.1	4.0×10 ⁻³	1.1×10 ⁻¹	5.7×10 ³	1.5×10 ⁵
Ru-97	Ruthenium (44)	5.0	1.4×10 ²	5.0	1.4×10 ²	1.7×10 ⁴	4.6×10 ⁵
Ru-103 (a)		2.0	5.4×10 ¹	2.0	5.4×10 ¹	1.2×10 ³	3.2×10 ⁴
Ru-105		1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.5×10 ⁵	6.7×10 ⁶
Ru-106 (a)		2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	1.2×10 ²	3.3×10 ³
S-35	Sulphur (16)	4.0×10 ¹	1.1×10 ³	3.0	8.1×10 ¹	1.6×10 ³	4.3×10 ⁴
Sb-122	Antimony (51)	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.5×10 ⁴	4.0×10 ⁵
Sb-124		6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	6.5×10 ²	1.7×10 ⁴
Sb-125		2.0	5.4×10 ¹	1.0	2.7×10 ¹	3.9×10 ¹	1.0×10 ³
Sb-126		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	3.1×10 ³	8.4×10 ⁴
Sc-44	Scandium (21)	5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	6.7×10 ⁵	1.8×10 ⁷
Sc-46		5.0×10 ⁻¹	1.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	1.3×10 ³	3.4×10 ⁴
Sc-47		1.0×10 ¹	2.7×10 ²	7.0×10 ⁻¹	1.9×10 ¹	3.1×10 ⁴	8.3×10 ⁵
Sc-48		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	5.5×10 ⁴	1.5×10 ⁶
Se-75	Selenium (34)	3.0	8.1×10 ¹	3.0	8.1×10 ¹	5.4×10 ²	1.5×10 ⁴
Se-79		4.0×10 ¹	1.1×10 ³	2.0	5.4×10 ¹	2.6×10 ⁻³	7.0×10 ⁻²
Si-31	Silicon (14)	6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.4×10 ⁶	3.9×10 ⁷
Si-32		4.0×10 ¹	1.1×10 ³	5.0×10 ⁻¹	1.4×10 ¹	3.9	1.1×10 ²
Sm-145	Samarium (62)	1.0×10 ¹	2.7×10 ²	1.0×10 ¹	2.7×10 ²	9.8×10 ¹	2.6×10 ³
Sm-147		Unlimited	Unlimited	Unlimited	Unlimited	8.5×10 ⁻¹	2.3×10 ⁻⁸
Sm-151		4.0×10 ¹	1.1×10 ³	1.0×10 ¹	2.7×10 ²	9.7×10 ⁻¹	2.6×10 ¹
Sm-153		9.0	2.4×10 ²	6.0×10 ⁻¹	1.6×10 ¹	1.6×10 ⁴	4.4×10 ⁵
Sn-113 (a)	Tin (50)	4.0	1.1×10 ²	2.0	5.4×10 ¹	3.7×10 ²	1.0×10 ⁴
Sn-117m		7.0	1.9×10 ²	4.0×10 ⁻¹	1.1×10 ¹	3.0×10 ³	8.2×10 ⁴
Sn-119m		4.0×10 ¹	1.1×10 ³	3.0×10 ¹	8.1×10 ²	1.4×10 ²	3.7×10 ³
Sn-121m (a)		4.0×10 ¹	1.1×10 ³	9.0×10 ⁻¹	2.4×10 ¹	2.0	5.4×10 ¹
Sn-123		8.0×10 ⁻¹	2.2×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	3.0×10 ²	8.2×10 ³
Sn-125		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ³	1.1×10 ⁵
Sn-126 (a)		6.0×10 ⁻¹	1.6×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.0×10 ⁻³	2.8×10 ⁻²
Sr-82 (a)	Strontium (38)	2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	2.3×10 ³	6.2×10 ⁴
Sr-85		2.0	5.4×10 ¹	2.0	5.4×10 ¹	8.8×10 ²	2.4×10 ⁴
Sr-85m		5.0	1.4×10 ²	5.0	1.4×10 ²	1.2×10 ⁶	3.3×10 ⁷
Sr-87m		3.0	8.1×10 ¹	3.0	8.1×10 ¹	4.8×10 ⁵	1.3×10 ⁷
Sr-89		6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.1×10 ³	2.9×10 ⁴
Sr-90 (a)		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	5.1	1.4×10 ²
Sr-91 (a)		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.3×10 ⁵	3.6×10 ⁶
Sr-92 (a)		1.0	2.7×10 ¹	3.0×10 ⁻¹	8.1	4.7×10 ⁵	1.3×10 ⁷
T(H-3)	Tritium (1)	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	3.6×10 ²	9.7×10 ³
Ta-178 (long-lived)	Tantalum (73)	1.0	2.7×10 ¹	8.0×10 ⁻¹	2.2×10 ¹	4.2×10 ⁶	1.1×10 ⁸
Ta-179		3.0×10 ¹	8.1×10 ²	3.0×10 ¹	8.1×10 ²	4.1×10 ¹	1.1×10 ³
Ta-182		9.0×10 ⁻¹	2.4×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	2.3×10 ²	6.2×10 ³

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
Tb-157	Terbium (65)	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	5.6×10 ⁻¹	1.5×10 ¹
Tb-158		1.0	2.7×10 ¹	1.0	2.7×10 ¹	5.6×10 ⁻¹	1.5×10 ¹
Tb-160		1.0	2.7×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	4.2×10 ²	1.1×10 ⁴
Tc-95m (a)	Technetium (43)	2.0	5.4×10 ¹	2.0	5.4×10 ¹	8.3×10 ²	2.2×10 ⁴
Tc-96		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.2×10 ⁴	3.2×10 ⁵
Tc-96m (a)		4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.4×10 ⁶	3.8×10 ⁷
Tc-97		Unlimited	Unlimited	Unlimited	Unlimited	5.2×10 ⁻⁵	1.4×10 ⁻³
Tc-97m		4.0×10 ¹	1.1×10 ³	1.0	2.7×10 ¹	5.6×10 ²	1.5×10 ⁴
Tc-98		8.0×10 ⁻¹	2.2×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	3.2×10 ⁻⁵	8.7×10 ⁻⁴
Tc-99		4.0×10 ¹	1.1×10 ³	9.0×10 ⁻¹	2.4×10 ¹	6.3×10 ⁻⁴	1.7×10 ⁻²
Tc-99m		1.0×10 ¹	2.7×10 ²	4.0	1.1×10 ²	1.9×10 ⁵	5.3×10 ⁶
Te-121	Tellurium (52)	2.0	5.4×10 ¹	2.0	5.4×10 ¹	2.4×10 ³	6.4×10 ⁴
Te-121m		5.0	1.4×10 ²	3.0	8.1×10 ¹	2.6×10 ²	7.0×10 ³
Te-123m		8.0	2.2×10 ²	1.0	2.7×10 ¹	3.3×10 ²	8.9×10 ³
Te-125m		2.0×10 ¹	5.4×10 ²	9.0×10 ⁻¹	2.4×10 ¹	6.7×10 ²	1.8×10 ⁴
Te-127		2.0×10 ¹	5.4×10 ²	7.0×10 ⁻¹	1.9×10 ¹	9.8×10 ⁴	2.6×10 ⁶
Te-127m (a)		2.0×10 ¹	5.4×10 ²	5.0×10 ⁻¹	1.4×10 ¹	3.5×10 ²	9.4×10 ³
Te-129		7.0×10 ⁻¹	1.9×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	7.7×10 ⁵	2.1×10 ⁷
Te-129m (a)		8.0×10 ⁻¹	2.2×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.1×10 ³	3.0×10 ⁴
Te-131m (a)		7.0×10 ⁻¹	1.9×10 ¹	5.0×10 ⁻¹	1.4×10 ¹	3.0×10 ⁴	8.0×10 ⁵
Te-132 (a)		5.0×10 ⁻¹	1.4×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	1.1×10 ⁴	3.0×10 ⁵
Th-227	Thorium (90)	1.0×10 ¹	2.7×10 ²	5.0×10 ⁻³	1.4×10 ⁻¹	1.1×10 ³	3.1×10 ⁴
Th-228 (a)		5.0×10 ⁻¹	1.4×10 ¹	1.0×10 ⁻³	2.7×10 ⁻²	3.0×10 ¹	8.2×10 ²
Th-229		5.0	1.4×10 ²	5.0×10 ⁻⁴	1.4×10 ⁻²	7.9×10 ⁻³	2.1×10 ⁻¹
Th-230		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	7.6×10 ⁻⁴	2.1×10 ⁻²
Th-231		4.0×10 ¹	1.1×10 ³	2.0×10 ⁻²	5.4×10 ⁻¹	2.0×10 ⁴	5.3×10 ⁵
Th-232		Unlimited	Unlimited	Unlimited	Unlimited	4.0×10 ⁻⁹	1.1×10 ⁻⁷
Th-234 (a)		3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	8.6×10 ²	2.3×10 ⁴
Th(nat)		Unlimited	Unlimited	Unlimited	Unlimited	8.1×10 ⁻⁹	2.2×10 ⁻⁷
Ti-44 (a)	Titanium (22)	5.0×10 ⁻¹	1.4×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	6.4	1.7×10 ²
Tl-200	Thallium (81)	9.0×10 ⁻¹	2.4×10 ¹	9.0×10 ⁻¹	2.4×10 ¹	2.2×10 ⁴	6.0×10 ⁵
Tl-201		1.0×10 ¹	2.7×10 ²	4.0	1.1×10 ²	7.9×10 ³	2.1×10 ⁵
Tl-202		2.0	5.4×10 ¹	2.0	5.4×10 ¹	2.0×10 ³	5.3×10 ⁴
Tl-204		1.0×10 ¹	2.7×10 ²	7.0×10 ⁻¹	1.9×10 ¹	1.7×10 ¹	4.6×10 ²
Tm-167	Thulium (69)	7.0	1.9×10 ²	8.0×10 ⁻¹	2.2×10 ¹	3.1×10 ³	8.5×10 ⁴
Tm-170		3.0	8.1×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.2×10 ²	6.0×10 ³
Tm-171		4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³
U-230 (fast lung absorption) (a)(d).	Uranium (92)	4.0×10 ¹	1.1×10 ³	1.0×10 ⁻¹	2.7	1.0×10 ³	2.7×10 ⁴
U-230 (medium lung absorption) (a)(e).		4.0×10 ¹	1.1×10 ³	4.0×10 ⁻³	1.1×10 ⁻¹	1.0×10 ³	2.7×10 ⁴
U-230 (slow lung absorption) (a)(f).		3.0×10 ¹	8.1×10 ²	3.0×10 ⁻³	8.1×10 ⁻²	1.0×10 ³	2.7×10 ⁴
U-232 (fast lung absorption) (d).		4.0×10 ¹	1.1×10 ³	1.0×10 ⁻²	2.7×10 ⁻¹	8.3×10 ⁻¹	2.2×10 ¹
U-232 (medium lung absorption) (e).		4.0×10 ¹	1.1×10 ³	7.0×10 ⁻³	1.9×10 ⁻¹	8.3×10 ⁻¹	2.2×10 ¹
U-232 (slow lung absorption) (f).		1.0×10 ¹	2.7×10 ²	1.0×10 ⁻³	2.7×10 ⁻²	8.3×10 ⁻¹	2.2×10 ¹
U-233 (fast lung absorption) (d).		4.0×10 ¹	1.1×10 ³	9.0×10 ⁻²	2.4	3.6×10 ⁻⁴	9.7×10 ⁻³
U-233 (medium lung absorption) (e).		4.0×10 ¹	1.1×10 ³	2.0×10 ⁻²	5.4×10 ⁻¹	3.6×10 ⁻⁴	9.7×10 ⁻³
U-233 (slow lung absorption) (f).		4.0×10 ¹	1.1×10 ³	6.0×10 ⁻³	1.6×10 ⁻¹	3.6×10 ⁻⁴	9.7×10 ⁻³
U-234 (fast lung absorption) (d).		4.0×10 ¹	1.1×10 ³	9.0×10 ⁻²	2.4	2.3×10 ⁻⁴	6.2×10 ⁻³
U-234 (medium lung absorption) (e).		4.0×10 ¹	1.1×10 ³	2.0×10 ⁻²	5.4×10 ⁻¹	2.3×10 ⁻⁴	6.2×10 ⁻³
U-234 (slow lung absorption) (f).		4.0×10 ¹	1.1×10 ³	6.0×10 ⁻³	1.6×10 ⁻¹	2.3×10 ⁻⁴	6.2×10 ⁻³
U-235 (all lung absorption types) (a),(d),(e),(f).		Unlimited	Unlimited	Unlimited	Unlimited	8.0×10 ⁻⁸	2.2×10 ⁻⁶
U-236 (fast lung absorption) (d).		Unlimited	Unlimited	Unlimited	Unlimited	2.4×10 ⁻⁶	6.5×10 ⁻⁵
U-236 (medium lung absorption) (e).		4.0×10 ¹	1.1×10 ³	2.0×10 ⁻²	5.4×10 ⁻¹	2.4×10 ⁻⁶	6.5×10 ⁻⁵
U-236 (slow lung absorption) (f).		4.0×10 ¹	1.1×10 ³	6.0×10 ⁻³	1.6×10 ⁻¹	2.4×10 ⁻⁶	6.5×10 ⁻⁵
U-238 (all lung absorption types) (d),(e),(f).		Unlimited	Unlimited	Unlimited	Unlimited	1.2×10 ⁻⁸	3.4×10 ⁻⁷

Symbol of radionuclide	Element and atomic number	A ₁ (TBq)	A ₁ (Ci) ^b	A ₂ (TBq)	A ₂ (Ci) ^b	Specific activity	
						(TBq/g)	(Ci/g)
U (nat)	.....	Unlimited	Unlimited	Unlimited	Unlimited	2.6×10 ⁻⁸	7.1×10 ⁻⁷
U (enriched to 20% or less)(g)	.....	Unlimited	Unlimited	Unlimited	Unlimited	see § 173.434	see § 173.434
U (dep)	.....	Unlimited	Unlimited	Unlimited	Unlimited	see § 173.434	see § 173.434
V-48	Vanadium (23)	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	6.3×10 ³	1.7×10 ⁵
V-49	.....	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	3.0×10 ²	8.1×10 ³
W-178 (a)	Tungsten (74)	9.0	2.4×10 ²	5.0	1.4×10 ²	1.3×10 ³	3.4×10 ⁴
W-181	.....	3.0×10 ¹	8.1×10 ²	3.0×10 ¹	8.1×10 ²	2.2×10 ²	6.0×10 ³
W-185	.....	4.0×10 ¹	1.1×10 ³	8.0×10 ⁻¹	2.2×10 ¹	3.5×10 ²	9.4×10 ³
W-187	.....	2.0	5.4×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	2.6×10 ⁴	7.0×10 ⁵
W-188 (a)	.....	4.0×10 ⁻¹	1.1×10 ¹	3.0×10 ⁻¹	8.1	3.7×10 ²	1.0×10 ⁴
Xe-122 (a)	Xenon (54)	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	4.8×10 ⁴	1.3×10 ⁶
Xe-123	.....	2.0	5.4×10 ¹	7.0×10 ⁻¹	1.9×10 ¹	4.4×10 ⁵	1.2×10 ⁷
Xe-127	.....	4.0	1.1×10 ²	2.0	5.4×10 ¹	1.0×10 ³	2.8×10 ⁴
Xe-131m	.....	4.0×10 ¹	1.1×10 ³	4.0×10 ¹	1.1×10 ³	3.1×10 ³	8.4×10 ⁴
Xe-133	.....	2.0×10 ¹	5.4×10 ²	1.0×10 ¹	2.7×10 ²	6.9×10 ³	1.9×10 ⁵
Xe-135	.....	3.0	8.1×10 ¹	2.0	5.4×10 ¹	9.5×10 ⁴	2.6×10 ⁶
Y-87 (a)	Yttrium (39)	1.0	2.7×10 ¹	1.0	2.7×10 ¹	1.7×10 ⁴	4.5×10 ⁵
Y-88	.....	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	5.2×10 ²	1.4×10 ⁴
Y-90	.....	3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	2.0×10 ⁴	5.4×10 ⁵
Y-91	.....	6.0×10 ⁻¹	1.6×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	9.1×10 ²	2.5×10 ⁴
Y-91m	.....	2.0	5.4×10 ¹	2.0	5.4×10 ¹	1.5×10 ⁶	4.2×10 ⁷
Y-92	.....	2.0×10 ⁻¹	5.4	2.0×10 ⁻¹	5.4	3.6×10 ⁵	9.6×10 ⁶
Y-93	.....	3.0×10 ⁻¹	8.1	3.0×10 ⁻¹	8.1	1.2×10 ⁵	3.3×10 ⁶
Yb-169	Ytterbium (70)	4.0	1.1×10 ²	1.0	2.7×10 ¹	8.9×10 ²	2.4×10 ⁴
Yb-175	.....	3.0×10 ¹	8.1×10 ²	9.0×10 ⁻¹	2.4×10 ¹	6.6×10 ³	1.8×10 ⁵
Zn-65	Zinc (30)	2.0	5.4×10 ¹	2.0	5.4×10 ¹	3.0×10 ²	8.2×10 ³
Zn-69	.....	3.0	8.1×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.8×10 ⁶	4.9×10 ⁷
Zn-69m (a)	.....	3.0	8.1×10 ¹	6.0×10 ⁻¹	1.6×10 ¹	1.2×10 ⁵	3.3×10 ⁶
Zr-88	Zirconium (40)	3.0	8.1×10 ¹	3.0	8.1×10 ¹	6.6×10 ²	1.8×10 ⁴
Zr-93	.....	Unlimited	Unlimited	Unlimited	Unlimited	9.3×10 ⁻⁵	2.5×10 ⁻³
Zr-95 (a)	.....	2.0	5.4×10 ¹	8.0×10 ⁻¹	2.2×10 ¹	7.9×10 ²	2.1×10 ⁴
Zr-97 (a)	.....	4.0×10 ⁻¹	1.1×10 ¹	4.0×10 ⁻¹	1.1×10 ¹	7.1×10 ⁴	1.9×10 ⁶

^aA₁ and/or A₂ values include contributions from daughter nuclides with half-lives less than 10 days.
^bThe values of A₁ and A₂ in curies (Ci) are approximate and for information only; the regulatory standard units are Terabecquerels (TBq), (see § 171.10).
^cThe quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.
^dThese values apply only to compounds of uranium that take the chemical form of UF₆, UO₂F₂ and UO₂(NO₃)₂ in both normal and accident conditions of transport.
^eThese values apply only to compounds of uranium that take the chemical form of UO₃, UF₄, UCl₄ and hexavalent compounds in both normal and accident conditions of transport.
^fThese values apply to all compounds of uranium other than those specified in notes (d) and (e) of this table.
^gThese values apply to unirradiated uranium only.
^hA₁ = 0.1 TBq (2.7 Ci) and A₂ = 0.001 TBq (0.027 Ci) for Cf-252 for domestic use.
ⁱA₂ = 0.74 TBq (20 Ci) for Mo-99 for domestic use.

[69 FR 3678, Jan. 26, 2004; 69 FR 55119, Sept. 13, 2004, as amended at 71 FR 54395, Sept. 14, 2006]

§ 173.436 Exempt material activity concentrations and exempt consignment activity limits for radionuclides.

The Table of Exempt material activity concentrations and exempt consignment activity limits for radionuclides is as follows:

Symbol of radionuclide	Element and atomic number	Activity concentration for exempt material (Bq/g)	Activity concentration for exempt material (Ci/g)	Activity limit for exempt consignment (Bq)	Activity limit for exempt consignment (Ci)
Ac-225	Actinium (89)	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁴	2.7×10 ⁻⁷
Ac-227	.....	1.0×10 ⁻¹	2.7×10 ⁻¹²	1.0×10 ³	2.7×10 ⁻⁸
Ac-228	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-105	Silver (47)	1.0×10 ²	2.7×10 ⁻⁹	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-108m (b)	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵
Ag-110m	.....	1.0×10 ¹	2.7×10 ⁻¹⁰	1.0×10 ⁶	2.7×10 ⁻⁵