Fission Products Per Tonne of Fuel

used for 50.68 GW-day LWR burnup at power of 36.5 MW and $3.14 \times 10^{14} N/\mathrm{cm}^2/s$ neutron flux,
at discharge, as calculated by ORIGEN2 version 2.1 on 9 October 2013.
Radiotoxicity in Sieverts computed for adult ingestion using dose factors from ICRP publication 119

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{127}I	82.01 gm	646.2 mM									
^{128}I	328.6 μg	2.569 μM	715.2 TBq	2.177×10^{9}	β	24.99 m	836.8 keV	95.88 W	291.8 kW	32.90 kSv	100.1 MSv
^{129}I	271.6 gm	2.107 M	1.775 GBq	6.535 MBq	β	16.10 My	78.03 keV	22.19 μW	81.70 nW	195.3 Sv	718.9 mSv
^{130}I	26.77 mg	206.1 μM	1.933×10^{6}	7.221×10^{7}	β	12.36 h	2.429 MeV	752.1 W	28.09 kW	3.866 MSv	144.4 MSv
^{130m}I	128.3 μg	987.6 nM	763.3 TBq	5.949×10^{9}	γ	8.840 m	307.6 keV	37.62 W	293.2 kW		
^{131}I	8.021 gm	61.27 mM	3.681×10^{7}	4.589×10^{6}	β	8.023 d	573.0 keV	3.379 kW	421.3 W	809.8 MSv	101.0 MSv
^{132}I	137.9 mg	1.045 mM	5.269×10^{7}	3.821×10^{8}	β	2.295 h	2.773 MeV	23.41 kW	169.8 kW	15.28 MSv	110.8 MSv
^{133}I	1.730 gm	13.02 mM	7.256×10^{7}	4.194×10^{7}	β	20.80 h	1.013 MeV	11.78 kW	6.809 kW	312.0 MSv	180.4 MSv
^{133m}I	6.872 μg	51.71 nM	2.398×10^{6}	3.490×10^{11}	γ	9.000 s	1.631 MeV	626.5 W	91.17 MW		
^{134}I	80.26 mg	599.4 μM	7.925×10^{7}	9.874×10^{8}	β	52.50 m	3.248 MeV	41.24 kW	513.8 kW	8.717 MSv	108.6 MSv
^{134m}I	606.3 μg	4.528 μM	8.510×10^{6}	1.404×10^{10}	γ	3.600 m	346.8 keV	472.8 W	779.8 kW		
^{135}I	524.4 mg	3.887 mM	6.815×10^{7}	1.300×10^{8}	β	6.570 h	1.936 MeV	21.14 kW	40.31 kW	63.38 MSv	120.9 MSv
^{136}I	869.7 μg	6.399 μM	3.218×10^{7}	3.700×10^{10}	β	1.390 m	4.256 MeV	21.94 kW	25.23 MW		
^{136m}I	280.2 μg	2.062 μM	1.870×10^{7}	6.674×10^{10}	β	46.90 s	3.825 MeV	11.46 kW	40.90 MW		
^{137}I	247.0 μg	1.804 μM	3.061×10^{7}	1.239×10^{11}	β	24.51 s	3.542 MeV	17.37 kW	70.32 MW		
^{138}I	31.62 μg	229.3 nM	1.495×10^{7}	4.728×10^{11}	β	6.460 s	4.000 MeV	9.580 kW	303.0 MW		
^{139}I	5.214 μg	37.53 nM	6.527×10^{6}	1.252×10^{12}	β	2.300 s	4.224 MeV	4.417 kW	847.1 MW		
^{140}I	513.8 ng	3.672 nM	1.782×10^{6}	3.468×10^{12}	β	860.0 ms	5.020 MeV	1.433 kW	2.789 GW		
^{141}I	40.11 ng	284.6 pM	297.0 TBq	7.405×10^{12}	β	430.0 ms	4.834 MeV	230.0 W	5.734 GW		
^{142}I	3.013 ng	21.23 pM	45.21 TBq	1.500×10^{13}	β	200.0 ms	6.836 MeV	49.51 W	16.43 GW		
^{143}I	342.7 pg	2.397 pM	3.050 TBq	8.900×10^{12}	β	100.0 ms	5.511 MeV	2.693 W	7.858 GW		
^{144}I	11.41 pg	$\leq$ 1 pM	249.4 GBq	2.186×10^{13}	β	50.00 ms	7.216 MeV	288.3 mW	25.27 GW		
E $_{53}$I	364.1 gm	2.833 M	4.289×10^{8}	1.178×10^{6}				169.4 kW	465.3 W	1.213 GSv	3.331 MSv
^{140}Ce	1.870 kg	13.37 M									
^{141}Ce	55.55 gm	394.2 mM	5.857×10^{7}	1.054×10^{6}	β	32.50 d	246.9 keV	2.317 kW	41.71 W	41.58 MSv	748.6 kSv
^{142}Ce	1.711 kg	12.06 M	3.190 Bq	1.864 mBq	2β	50.00 Py	1.417 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{143}Ce	2.128 gm	14.89 mM	5.228×10^{7}	2.457×10^{7}	β	1.377 d	710.8 keV	5.953 kW	2.797 kW	57.51 MSv	27.02 MSv
^{144}Ce	407.3 gm	2.830 M	4.810×10^{7}	118.1 TBq	β	285.0 d	111.9 keV	862.3 W	2.117 W	250.1 MSv	614.1 kSv
^{145}Ce	2.244 mg	15.48 μM	3.590×10^{7}	1.600×10^{10}	β	2.950 m	1.485 MeV	8.542 kW	3.807 MW		
^{146}Ce	8.663 mg	59.37 μM	2.908×10^{7}	3.357×10^{9}	β	13.52 m	439.2 keV	2.046 kW	236.2 kW		
^{147}Ce	558.9 μg	3.804 μM	2.268×10^{7}	4.058×10^{10}	β	57.00 s	2.123 MeV	7.715 kW	13.80 MW		
^{148}Ce	256.6 μg	1.735 μM	1.684×10^{7}	6.563×10^{10}	β	56.00 s	986.0 keV	2.660 kW	10.37 MW		
^{149}Ce	3.389 μg	22.76 nM	9.498×10^{6}	2.803×10^{12}	β	5.300 s	2.514 MeV	3.826 kW	1.129 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{150}Ce	1.623 μg	10.83 nM	4.518×10^{6}	2.784×10^{12}	β	4.000 s	1.520 MeV	1.100 kW	677.8 MW		
^{151}Ce	496.6 ng	3.290 nM	1.373×10^{6}	2.765×10^{12}	β	1.020 s	3.099 MeV	681.6 W	1.373 GW		
^{152}Ce	1.550 μg	10.20 nM	303.4 TBq	1.957×10^{11}	β	1.100 s	2.236 MeV	108.7 W	70.13 MW		
^{153}Ce	33.57 ng	219.5 pM	53.10 TBq	1.582×10^{12}	β	1.500 s	3.812 MeV	32.43 W	966.0 MW		
^{154}Ce	8.119 ng	52.74 pM	6.131 TBq	7.551×10^{11}	β	2.000 s	2.950 MeV	2.898 W	356.9 MW		
^{155}Ce	183.8 pg	1.186 pM	694.9 GBq	3.781×10^{12}	β	200.0 ms	4.570 MeV	508.8 mW	2.768 GW		
^{156}Ce	28.32 pg	$\leq$ 1 pM	65.23 GBq	2.303×10^{12}	β	150.0 ms	3.832 MeV	40.04 mW	1.414 GW		
^{157}Ce	$\leq$ 1 pg	$\leq$ 1 pM	5.017 GBq	7.353×10^{12}	β	50.00 ms	5.354 MeV	4.303 mW	6.307 GW		
E $_{58}$Ce	4.046 kg	28.66 M	2.792×10^{8}	69.01 TBq				35.85 kW	8.860 W	349.2 MSv	86.31 kSv
^{132}Cs	2.191 mg	16.61 μM	12.39 TBq	5.655×10^{6}	ϵ	6.530 d	728.5 keV	1.446 W	660.0 W	6.195 kSv	2.827 MSv
^{133}Cs	1.603 kg	12.06 M									
^{134}Cs	234.7 gm	1.753 M	1.124×10^{7}	47.89 TBq	β	2.065 y	1.717 MeV	3.092 kW	13.17 W	213.6 MSv	909.9 kSv
^{134m}Cs	8.790 mg	65.64 μM	2.624×10^{6}	2.985×10^{8}	γ	2.908 h	135.2 keV	56.84 W	6.466 kW	52.48 kSv	5.970 MSv
^{135}Cs	618.4 gm	4.584 M	26.36 GBq	42.63 MBq	β	2.300 My	56.29 keV	237.7 μW	384.4 nW	52.72 Sv	85.25 mSv
^{135m}Cs	1.904 mg	14.11 μM	1.852×10^{6}	9.727×10^{8}	γ	53.00 m	1.619 MeV	480.4 W	252.3 kW	35.19 kSv	18.48 MSv
^{136}Cs	1.147 gm	8.440 mM	3.111×10^{6}	2.712×10^{6}	β	13.03 d	2.299 MeV	1.146 kW	999.1 W	9.333 MSv	8.137 MSv
^{137}Cs	1.810 kg	13.22 M	5.828×10^{6}	3.220 TBq	β	30.04 y	186.6 keV	174.2 W	96.24 mW	75.76 MSv	41.86 kSv
^{138}Cs	41.34 mg	299.8 μM	6.475×10^{7}	1.566×10^{9}	β	33.41 m	3.558 MeV	36.91 kW	892.8 kW	5.957 MSv	144.1 MSv
^{138m}Cs	186.4 μg	1.352 μM	3.242×10^{6}	1.739×10^{10}	γ	2.910 m	933.8 keV	485.0 W	2.602 MW		
^{139}Cs	11.51 mg	82.86 μM	6.131×10^{7}	5.327×10^{9}	β	9.270 m	1.997 MeV	19.61 kW	1.704 MW		
^{140}Cs	1.178 mg	8.419 μM	5.509×10^{7}	4.677×10^{10}	β	1.062 m	4.062 MeV	35.85 kW	30.43 MW		
^{141}Cs	341.2 μg	2.421 μM	4.040×10^{7}	1.184×10^{11}	β	24.84 s	3.203 MeV	20.73 kW	60.76 MW		
^{142}Cs	13.92 μg	98.08 nM	2.409×10^{7}	1.731×10^{12}	β	1.684 s	4.589 MeV	17.71 kW	1.272 GW		
^{143}Cs	6.666 μg	46.64 nM	1.145×10^{7}	1.718×10^{12}	β	1.791 s	3.734 MeV	6.849 kW	1.027 GW		
^{144}Cs	1.235 μg	8.580 nM	3.511×10^{6}	2.843×10^{12}	β	994.0 ms	5.390 MeV	3.032 kW	2.455 GW		
^{145}Cs	171.3 ng	1.182 nM	881.0 TBq	5.143×10^{12}	β	594.0 ms	4.022 MeV	567.6 W	3.313 GW		
^{146}Cs	8.665 ng	59.37 pM	130.4 TBq	1.505×10^{13}	β	323.0 ms	5.802 MeV	121.2 W	13.99 GW		
^{147}Cs	4.243 ng	28.87 pM	21.61 TBq	5.093×10^{12}	β	225.0 ms	4.905 MeV	16.98 W	4.002 GW		
^{148}Cs	100.5 pg	$\leq$ 1 pM	1.407 TBq	1.400×10^{13}	β	146.0 ms	6.566 MeV	1.480 W	14.73 GW		
^{150}Cs	$\leq$ 1 pg	$\leq$ 1 pM	1.329 GBq	2.239×10^{13}	β	100.0 ms	7.261 MeV	1.546 mW	26.04 GW		
E $_{55}$Cs	4.267 kg	31.63 M	2.895×10^{8}	67.85 TBq				146.8 kW	34.41 W	304.7 MSv	71.41 kSv
^{99}Ru	6.991 mg	70.68 μM									
^{100}Ru	218.3 gm	2.185 M									
^{101}Ru	1.166 kg	11.56 M									
^{102}Ru	1.217 kg	11.94 M									
^{103}Ru	51.82 gm	503.6 mM	6.190×10^{7}	1.195×10^{6}	β	39.26 d	564.4 keV	5.597 kW	108.0 W	45.19 MSv	872.0 kSv
^{104}Ru	863.0 gm	8.306 M									
^{105}Ru	183.8 mg	1.752 mM	4.573×10^{7}	2.488×10^{8}	β	4.440 h	1.184 MeV	8.677 kW	47.21 kW	11.89 MSv	64.69 MSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{106}Ru	224.5 gm	2.120 M	2.781×10^{7}	123.9 TBq	β	1.020 y	10.03 keV	44.68 W	199.0 mW	194.7 MSv	867.1 kSv
^{107}Ru	1.806 mg	16.89 μM	2.798×10^{7}	1.549×10^{10}	β	3.750 m	1.452 MeV	6.507 kW	3.603 MW		
^{108}Ru	1.360 mg	12.60 μM	1.948×10^{7}	1.432×10^{10}	β	4.550 m	515.9 keV	1.610 kW	1.184 MW		
^{109}Ru	109.0 μg	1.001 μM	1.193×10^{7}	1.094×10^{11}	β	34.50 s	2.383 MeV	4.554 kW	41.78 MW		
^{110}Ru	21.91 μg	199.3 nM	5.199×10^{6}	2.373×10^{11}	β	11.60 s	1.539 MeV	1.282 kW	58.51 MW		
^{111}Ru	9.123 μg	82.25 nM	2.226×10^{6}	2.440×10^{11}	β	2.120 s	3.242 MeV	1.156 kW	126.7 MW		
^{112}Ru	172.5 ng	1.541 nM	918.7 TBq	5.326×10^{12}	β	1.750 s	2.206 MeV	324.7 W	1.882 GW		
^{113}Ru	355.1 ng	3.145 nM	474.3 TBq	1.336×10^{12}	β	800.0 ms	4.046 MeV	307.4 W	865.7 MW		
^{114}Ru	284.5 ng	2.497 nM	206.2 TBq	7.248×10^{11}	β	530.0 ms	2.947 MeV	97.34 W	342.1 MW		
^{115}Ru	19.11 ng	166.3 pM	95.16 TBq	4.980×10^{12}	β	700.0 ms	4.890 MeV	74.55 W	3.901 GW		
^{116}Ru	8.259 ng	71.24 pM	21.16 TBq	2.562×10^{12}	β	1.700 s	3.729 MeV	12.64 W	1.530 GW		
^{117}Ru	268.4 pg	2.295 pM	3.101 TBq	1.155×10^{13}	β	340.0 ms	5.821 MeV	2.892 W	10.77 GW		
^{118}Ru	3.603 ng	30.55 pM	20.69 TBq	5.742×10^{12}	β	700.0 ms	4.429 MeV	14.68 W	4.074 GW		
^{120}Ru	$\leq$ 1 pg	$\leq$ 1 pM	4.340 GBq	1.187×10^{13}	β	80.00 ms	5.319 MeV	3.698 mW	10.12 GW		
A $_{44}$Ru	3.741 kg	36.61 M	2.040×10^{8}	54.53 TBq				30.26 kW	8.090 W	251.7 MSv	67.30 kSv
^{122}Te	1.235 gm	10.13 mM									
^{123}Te	17.22 mg	140.1 μM	185.2 mBq	10.75 Bq	ϵ	92.00 Py	17.10 keV	$\leq$ 1 pW	$\leq$ 1 pW	814.9 pSv	47.32 nSv
^{123m}Te	4.066 mg	33.08 μM	1.335 TBq	328.3 TBq	γ	119.5 d	245.8 keV	52.56 mW	12.93 W	1.869 kSv	459.7 kSv
^{124}Te	835.2 mg	6.741 mM									
^{125}Te	9.172 gm	73.43 mM									
^{125m}Te	244.4 mg	1.957 mM	162.9 TBq	666.5 TBq	γ	57.40 d	141.8 keV	3.701 W	15.14 W	141.7 kSv	579.9 kSv
^{126}Te	1.302 gm	10.34 mM									
^{127}Te	44.11 mg	347.6 μM	4.311×10^{6}	9.773×10^{7}	β	9.350 h	227.8 keV	157.3 W	3.566 kW	732.9 kSv	16.61 MSv
^{127m}Te	1.683 gm	13.26 mM	587.6 TBq	349.1 TBq	γ	109.0 d	90.74 keV	8.542 W	5.075 W	1.351 MSv	803.0 kSv
^{128}Te	170.8 gm	1.335 M	8.029 nBq	47.01 pBq	2β	$\geq 10^{18}$ y	867.2 keV	$\leq$ 1 pW	$\leq$ 1 pW		
^{129}Te	15.79 mg	122.5 μM	1.224×10^{7}	7.752×10^{8}	β	1.160 h	602.8 keV	1.182 kW	74.86 kW	771.1 kSv	48.84 MSv
^{129m}Te	1.649 gm	12.79 mM	1.839×10^{6}	1.115×10^{6}	γ	33.60 d	295.8 keV	87.15 W	52.85 W	5.517 MSv	3.346 MSv
^{130}Te	547.3 gm	4.213 M	70.54 nBq	128.9 pBq	2β	$\geq 10^{18}$ y	2.528 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{131}Te	15.29 mg	116.8 μM	3.250×10^{7}	2.126×10^{9}	β	25.00 m	1.139 MeV	5.930 kW	387.8 kW	2.828 MSv	184.9 MSv
^{131m}Te	184.3 mg	1.408 mM	5.443×10^{6}	2.953×10^{7}	β	1.250 d	1.622 MeV	1.414 kW	7.672 kW	10.34 MSv	56.11 MSv
^{132}Te	4.604 gm	34.90 mM	5.176×10^{7}	1.124×10^{7}	β	3.204 d	334.0 keV	2.770 kW	601.7 W	196.7 MSv	42.72 MSv
^{133}Te	10.19 mg	76.67 μM	4.285×10^{7}	4.205×10^{9}	β	12.45 m	1.745 MeV	11.98 kW	1.176 MW	3.085 MSv	302.8 MSv
^{133m}Te	26.59 mg	200.1 μM	2.512×10^{7}	9.447×10^{8}	β	55.40 m	2.982 MeV	12.00 kW	451.3 kW	7.034 MSv	264.5 MSv
^{134}Te	45.84 mg	342.3 μM	5.694×10^{7}	1.242×10^{9}	β	41.80 m	1.183 MeV	10.79 kW	235.4 kW	6.263 MSv	136.6 MSv
^{135}Te	189.9 μg	1.408 μM	3.060×10^{7}	1.611×10^{11}	β	19.00 s	3.105 MeV	15.22 kW	80.15 MW		
^{136}Te	107.1 μg	788.0 nM	1.566×10^{7}	1.462×10^{11}	β	17.50 s	2.841 MeV	7.128 kW	66.55 MW		
^{137}Te	5.186 μg	37.87 nM	4.518×10^{6}	8.712×10^{11}	β	2.490 s	4.291 MeV	3.106 kW	598.9 MW		
^{138}Te	603.7 ng	4.377 nM	1.114×10^{6}	1.845×10^{12}	β	1.400 s	3.588 MeV	640.4 W	1.061 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{139}Te	30.64 ng	220.5 pM	217.3 TBq	7.092×10^{12}	β	500.0 ms	5.251 MeV	182.8 W	5.966 GW		
^{140}Te	6.746 ng	48.21 pM	26.76 TBq	3.967×10^{12}	β	300.0 ms	4.243 MeV	18.19 W	2.696 GW		
^{141}Te	97.27 pg	$\leq$ 1 pM	1.222 TBq	1.256×10^{13}	β	100.0 ms	6.007 MeV	1.176 W	12.09 GW		
^{142}Te	22.37 pg	$\leq$ 1 pM	133.9 GBq	5.986×10^{12}	β	50.00 ms	4.630 MeV	99.33 mW	4.440 GW		
E $_{52}$Te	739.2 gm	5.715 M	2.859×10^{8}	386.8 TBq				72.62 kW	98.24 W	234.8 MSv	317.6 kSv
^{86}Sr	887.0 mg	10.32 mM									
^{87}Sr	7.615 mg	87.62 μM									
^{87m}Sr	864.3 ng	9.945 nM	410.7 GBq	4.752×10^{8}	γ	2.816 h	387.0 keV	25.46 mW	29.46 kW	12.32 Sv	14.26 MSv
^{88}Sr	519.1 gm	5.905 M									
^{89}Sr	26.49 gm	298.0 mM	2.849×10^{7}	1.076×10^{6}	β	50.57 d	583.2 keV	2.662 kW	100.5 W	74.07 MSv	2.796 MSv
^{90}Sr	780.6 gm	8.682 M	3.941×10^{6}	5.049 TBq	β	28.79 y	195.8 keV	123.6 W	158.3 mW	110.3 MSv	141.4 kSv
^{91}Sr	269.5 mg	2.964 mM	3.617×10^{7}	1.342×10^{8}	β	9.630 h	1.352 MeV	7.833 kW	29.06 kW	23.51 MSv	87.24 MSv
^{92}Sr	86.65 mg	942.8 μM	4.033×10^{7}	4.654×10^{8}	β	2.710 h	1.535 MeV	9.915 kW	114.4 kW	17.34 MSv	200.1 MSv
^{93}Sr	4.715 mg	50.75 μM	4.706×10^{7}	9.981×10^{9}	β	7.423 m	2.556 MeV	19.27 kW	4.087 MW		
^{94}Sr	764.8 μg	8.144 μM	4.496×10^{7}	5.879×10^{10}	β	1.255 m	2.112 MeV	15.21 kW	19.89 MW		
^{95}Sr	247.5 μg	2.607 μM	4.185×10^{7}	1.691×10^{11}	β	23.90 s	3.301 MeV	22.13 kW	89.41 MW		
^{96}Sr	26.77 μg	279.1 nM	2.911×10^{7}	1.087×10^{12}	β	1.060 s	2.472 MeV	11.53 kW	430.7 MW		
^{97}Sr	720.2 ng	7.430 nM	1.550×10^{7}	2.152×10^{13}	β	429.0 ms	4.188 MeV	10.40 kW	14.44 GW		
^{98}Sr	1.230 μg	12.56 nM	6.164×10^{6}	5.011×10^{12}	β	653.0 ms	3.187 MeV	3.147 kW	2.559 GW		
^{99}Sr	230.6 ng	2.331 nM	1.737×10^{6}	7.533×10^{12}	β	270.0 ms	5.203 MeV	1.448 kW	6.279 GW		
^{100}Sr	86.85 ng	869.1 pM	346.8 TBq	3.993×10^{12}	β	202.0 ms	3.963 MeV	220.2 W	2.535 GW		
^{101}Sr	2.986 ng	29.58 pM	49.03 TBq	1.642×10^{13}	β	118.0 ms	6.092 MeV	47.85 W	16.02 GW		
^{102}Sr	464.9 pg	4.560 pM	4.592 TBq	9.877×10^{12}	β	69.00 ms	4.879 MeV	3.589 W	7.720 GW		
^{103}Sr	5.392 pg	$\leq$ 1 pM	157.7 GBq	2.925×10^{13}	β	50.00 ms	7.026 MeV	177.5 mW	32.92 GW		
^{104}Sr	$\leq$ 1 pg	$\leq$ 1 pM	6.723 GBq	2.086×10^{13}	β	30.00 ms	5.973 MeV	6.433 mW	19.96 GW		
E $_{38}$Sr	1.327 kg	14.90 M	2.957×10^{8}	222.8 TBq				103.9 kW	78.30 W	225.3 MSv	169.7 kSv
^{89}Y	649.5 gm	7.305 M									
^{89m}Y	73.02 pg	$\leq$ 1 pM	21.33 GBq	2.921×10^{11}	γ	15.66 s	917.1 keV	3.134 mW	42.92 MW		
^{90}Y	204.5 mg	2.275 mM	4.118×10^{6}	2.014×10^{7}	β	2.671 d	935.2 keV	617.0 W	3.017 kW	11.12 MSv	54.37 MSv
^{90m}Y	1.722 μg	19.15 nM	716.0 GBq	4.158×10^{8}	γ	3.190 h	683.1 keV	78.36 mW	45.51 kW	121.7 Sv	70.69 MSv
^{91}Y	41.84 gm	460.2 mM	3.800×10^{7}	908.2 TBq	β	58.51 d	605.6 keV	3.687 kW	88.12 W	91.20 MSv	2.180 MSv
^{91m}Y	13.65 mg	150.2 μM	2.100×10^{7}	1.538×10^{9}	γ	49.71 m	557.6 keV	1.876 kW	137.4 kW	231.0 kSv	16.92 MSv
^{92}Y	113.8 mg	1.238 mM	4.055×10^{7}	3.563×10^{8}	β	3.540 h	1.698 MeV	11.03 kW	96.92 kW	19.87 MSv	174.6 MSv
^{93}Y	392.0 mg	4.219 mM	4.840×10^{7}	1.235×10^{8}	β	10.18 h	1.262 MeV	9.787 kW	24.97 kW	58.08 MSv	148.2 MSv
^{94}Y	12.84 mg	136.7 μM	4.977×10^{7}	3.876×10^{9}	β	18.70 m	2.811 MeV	22.41 kW	1.745 MW	4.031 MSv	314.0 MSv
^{95}Y	7.819 mg	82.38 μM	5.458×10^{7}	6.980×10^{9}	β	10.30 m	2.234 MeV	19.53 kW	2.498 MW	2.511 MSv	321.1 MSv
^{96}Y	1.653 mg	17.23 μM	5.210×10^{7}	3.152×10^{10}	β	5.340 s	3.869 MeV	32.29 kW	19.53 MW		
^{97}Y	11.68 μg	120.5 nM	4.529×10^{7}	3.878×10^{12}	β	3.750 s	3.097 MeV	22.47 kW	1.924 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{98}Y	2.265 μg	23.13 nM	3.217×10^{7}	1.420×10^{13}	β	590.0 ms	4.787 MeV	24.67 kW	10.89 GW		
^{99}Y	3.509 μg	35.47 nM	1.850×10^{7}	5.272×10^{12}	β	1.477 s	3.738 MeV	11.08 kW	3.158 GW		
^{100}Y	1.506 μg	15.07 nM	8.314×10^{6}	5.521×10^{12}	β	735.0 ms	5.825 MeV	7.759 kW	5.152 GW		
^{101}Y	638.6 ng	6.327 nM	2.705×10^{6}	4.236×10^{12}	β	450.0 ms	4.613 MeV	1.999 kW	3.130 GW		
^{102}Y	45.61 ng	447.5 pM	685.2 TBq	1.502×10^{13}	β	300.0 ms	6.733 MeV	739.1 W	16.20 GW		
^{103}Y	9.297 ng	90.32 pM	103.0 TBq	1.108×10^{13}	β	224.0 ms	5.538 MeV	91.39 W	9.830 GW		
^{104}Y	350.8 pg	3.375 pM	9.768 TBq	2.784×10^{13}	β	130.0 ms	7.624 MeV	11.93 W	34.01 GW		
^{105}Y	21.25 pg	$\leq$ 1 pM	486.9 GBq	2.291×10^{13}	β	150.0 ms	6.646 MeV	518.4 mW	24.40 GW		
^{107}Y	$\leq$ 1 pg	$\leq$ 1 pM	251.8 MBq	3.731×10^{13}	β	30.00 ms	7.477 MeV	301.6 μW	44.69 GW		
E $_{39}$Y	692.1 gm	7.774 M	4.163×10^{8}	601.5 TBq				170.0 kW	245.7 W	187.0 MSv	270.3 kSv
^{90}Zr	41.79 gm	464.8 mM									
^{90m}Zr	$\leq$ 1 pg	$\leq$ 1 pM	196.0 MBq	5.592×10^{12}	γ	809.2 ms	2.314 MeV	72.67 μW	2.073 GW		
^{91}Zr	834.8 gm	9.183 M									
^{92}Zr	956.1 gm	10.40 M									
^{93}Zr	1.073 kg	11.55 M	99.75 GBq	92.96 MBq	β	1.530 My	19.60 keV	313.2 μW	291.9 nW	109.7 Sv	102.3 mSv
^{94}Zr	1.125 kg	11.98 M	26.41 Bq	23.48 mBq	2β	6.000 Py	1.144 MeV	4.839 pW	$\leq$ 1 pW		
^{95}Zr	72.10 gm	759.7 mM	5.731×10^{7}	794.9 TBq	β	64.03 d	854.8 keV	7.848 kW	108.8 W	54.44 MSv	755.1 kSv
^{96}Zr	1.211 kg	12.63 M	4.282 mBq	3.536 μBq	2β	$\geq 10^{18}$ y	3.350 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{97}Zr	826.6 mg	8.529 mM	5.850×10^{7}	7.077×10^{7}	β	16.74 h	879.0 keV	8.238 kW	9.966 kW	122.8 MSv	148.6 MSv
^{98}Zr	432.5 μg	4.417 μM	5.946×10^{7}	1.375×10^{11}	β	30.70 s	902.8 keV	8.600 kW	19.88 MW		
^{99}Zr	33.62 μg	339.9 nM	5.909×10^{7}	1.758×10^{12}	β	2.200 s	2.414 MeV	22.85 kW	679.7 MW		
^{100}Zr	92.28 μg	923.6 nM	5.428×10^{7}	5.882×10^{11}	β	7.100 s	1.368 MeV	11.90 kW	129.0 MW		
^{101}Zr	27.71 μg	274.6 nM	3.472×10^{7}	1.253×10^{12}	β	2.300 s	3.123 MeV	17.37 kW	626.8 MW		
^{102}Zr	139.7 μg	1.371 μM	1.999×10^{7}	1.431×10^{11}	β	2.900 s	2.170 MeV	6.949 kW	49.74 MW		
^{103}Zr	3.328 μg	32.33 nM	7.622×10^{6}	2.290×10^{12}	β	1.300 s	4.137 MeV	5.052 kW	1.518 GW		
^{104}Zr	1.793 μg	17.25 nM	1.903×10^{6}	1.061×10^{12}	β	1.200 s	2.976 MeV	907.4 W	506.1 MW		
^{105}Zr	36.59 ng	348.7 pM	260.6 TBq	7.122×10^{12}	β	600.0 ms	5.008 MeV	209.1 W	5.715 GW		
^{106}Zr	7.032 ng	66.38 pM	28.26 TBq	4.019×10^{12}	β	900.0 ms	3.960 MeV	17.93 W	2.550 GW		
^{107}Zr	80.63 pg	$\leq$ 1 pM	1.267 TBq	1.571×10^{13}	β	240.0 ms	5.996 MeV	1.217 W	15.09 GW		
^{108}Zr	37.71 pg	$\leq$ 1 pM	357.7 GBq	9.486×10^{12}	β	80.00 ms	4.856 MeV	278.3 mW	7.380 GW		
^{109}Zr	$\leq$ 1 pg	$\leq$ 1 pM	26.40 GBq	2.763×10^{13}	β	60.00 ms	6.859 MeV	29.01 mW	30.36 GW		
A $_{40}$Zr	5.315 kg	56.98 M	3.532×10^{8}	66.45 TBq				89.94 kW	16.92 W	177.3 MSv	33.36 kSv
^{132}Ba	3.099 mg	23.49 μM									
^{134}Ba	107.8 gm	805.1 mM									
^{135}Ba	1.048 gm	7.768 mM									
^{135m}Ba	308.3 μg	2.285 μM	9.232 TBq	2.994×10^{7}	γ	1.196 d	266.6 keV	394.3 mW	1.279 kW	3.970 kSv	12.88 MSv
^{136}Ba	41.65 gm	306.5 mM									
^{136m}Ba	51.42 ng	378.4 pM	512.8 TBq	9.973×10^{12}	γ	308.4 ms	2.040 MeV	167.6 W	3.259 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{137}Ba	80.18 gm	585.7 mM									
^{137m}Ba	277.3 μg	2.025 μM	5.520×10^{6}	1.991×10^{10}	γ	2.552 m	662.5 keV	585.9 W	2.113 MW		
^{138}Ba	1.944 kg	14.10 M									
^{139}Ba	105.0 mg	755.9 μM	6.357×10^{7}	6.054×10^{8}	β	1.384 h	939.6 keV	9.569 kW	91.13 kW	7.628 MSv	72.65 MSv
^{140}Ba	22.70 gm	162.2 mM	6.127×10^{7}	2.699×10^{6}	β	12.77 d	470.8 keV	4.621 kW	203.6 W	159.3 MSv	7.018 MSv
^{141}Ba	21.22 mg	150.6 μM	5.735×10^{7}	2.703×10^{9}	β	18.27 m	1.729 MeV	15.89 kW	748.8 kW	4.015 MSv	189.2 MSv
^{142}Ba	11.76 mg	82.87 μM	5.387×10^{7}	4.581×10^{9}	β	10.60 m	1.469 MeV	12.68 kW	1.078 MW	1.885 MSv	160.3 MSv
^{143}Ba	216.8 μg	1.517 μM	4.655×10^{7}	2.147×10^{11}	β	14.50 s	2.659 MeV	19.83 kW	91.47 MW		
^{144}Ba	130.7 μg	908.1 nM	3.447×10^{7}	2.637×10^{11}	β	11.50 s	1.694 MeV	9.354 kW	71.57 MW		
^{145}Ba	38.83 μg	267.9 nM	1.804×10^{7}	4.646×10^{11}	β	4.310 s	3.207 MeV	9.269 kW	238.7 MW		
^{146}Ba	5.200 μg	35.63 nM	6.760×10^{6}	1.300×10^{12}	β	2.220 s	1.940 MeV	2.101 kW	404.0 MW		
^{147}Ba	1.236 μg	8.412 nM	1.576×10^{6}	1.275×10^{12}	β	893.0 ms	3.659 MeV	923.8 W	747.4 MW		
^{148}Ba	591.6 ng	3.999 nM	282.9 TBq	4.782×10^{11}	β	612.0 ms	2.619 MeV	118.7 W	200.6 MW		
^{149}Ba	10.68 ng	71.71 pM	32.62 TBq	3.054×10^{12}	β	344.0 ms	4.307 MeV	22.51 W	2.108 GW		
^{150}Ba	1.584 ng	10.56 pM	2.454 TBq	1.549×10^{12}	β	300.0 ms	3.411 MeV	1.341 W	846.6 MW		
^{152}Ba	1.788 pg	$\leq$ 1 pM	6.508 GBq	3.640×10^{12}	β	100.0 ms	4.191 MeV	4.370 mW	2.444 GW		
E $_{56}$Ba	2.198 kg	15.96 M	3.498×10^{8}	159.2 TBq				85.13 kW	38.74 W	172.8 MSv	78.65 kSv
^{138}La	7.637 mg	55.38 μM	5.424 Bq	710.2 Bq	ϵ	102.0 Gy	1.237 MeV	1.075 pW	140.8 pW	5.966 nSv	781.2 nSv
^{139}La	1.849 kg	13.31 M									
^{140}La	3.108 gm	22.21 mM	6.401×10^{7}	2.060×10^{7}	β	1.679 d	2.828 MeV	29.00 kW	9.331 kW	128.0 MSv	41.19 MSv
^{141}La	275.4 mg	1.954 mM	5.765×10^{7}	2.093×10^{8}	β	3.920 h	990.6 keV	9.149 kW	33.22 kW	20.75 MSv	75.36 MSv
^{142}La	104.5 mg	736.4 μM	5.524×10^{7}	5.286×10^{8}	β	1.518 h	3.572 MeV	31.61 kW	302.5 kW	9.943 MSv	95.15 MSv
^{143}La	14.93 mg	104.5 μM	5.191×10^{7}	3.477×10^{9}	β	14.14 m	1.972 MeV	16.40 kW	1.098 MW	2.907 MSv	194.7 MSv
^{144}La	626.5 μg	4.353 μM	4.544×10^{7}	7.253×10^{10}	β	40.80 s	3.445 MeV	25.08 kW	40.03 MW		
^{145}La	335.1 μg	2.312 μM	3.328×10^{7}	9.931×10^{10}	β	24.80 s	2.577 MeV	13.74 kW	41.00 MW		
^{146}La	63.73 μg	436.7 nM	2.196×10^{7}	3.446×10^{11}	β	6.270 s	4.124 MeV	14.51 kW	227.7 MW		
^{147}La	38.08 μg	259.2 nM	1.082×10^{7}	2.841×10^{11}	β	4.015 s	2.875 MeV	4.983 kW	130.9 MW		
^{148}La	1.896 μg	12.82 nM	4.114×10^{6}	2.170×10^{12}	β	1.260 s	4.602 MeV	3.033 kW	1.600 GW		
^{149}La	1.068 μg	7.171 nM	1.045×10^{6}	9.785×10^{11}	β	1.050 s	3.583 MeV	599.8 W	561.6 MW		
^{150}La	47.47 ng	316.6 pM	203.8 TBq	4.293×10^{12}	β	510.0 ms	5.268 MeV	172.0 W	3.623 GW		
^{151}La	9.004 ng	59.65 pM	26.11 TBq	2.900×10^{12}	β	300.0 ms	4.401 MeV	18.41 W	2.045 GW		
^{152}La	329.2 pg	2.167 pM	2.923 TBq	8.879×10^{12}	β	280.0 ms	6.071 MeV	2.843 W	8.636 GW		
^{153}La	48.11 pg	$\leq$ 1 pM	300.4 GBq	6.244×10^{12}	β	150.0 ms	5.209 MeV	250.7 mW	5.211 GW		
^{154}La	$\leq$ 1 pg	$\leq$ 1 pM	13.86 GBq	1.547×10^{13}	β	100.0 ms	6.836 MeV	15.18 mW	16.94 GW		
E $_{57}$La	1.853 kg	13.34 M	3.457×10^{8}	186.6 TBq				148.3 kW	80.05 W	161.6 MSv	87.25 kSv
^{140}Pr	76.89 ng	549.6 pM	1.128 TBq	1.467×10^{10}	ϵ	3.390 m	700.0 keV	126.5 mW	1.645 MW		
^{141}Pr	1.633 kg	11.59 M									
^{142}Pr	97.62 mg	687.9 μM	4.170×10^{6}	4.272×10^{7}	β	19.12 h	866.8 keV	579.1 W	5.932 kW	5.421 MSv	55.53 MSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{142m}Pr	243.3 μg	1.714 μM	816.6 TBq	3.356×10^{9}	γ	14.60 m	250.0 keV	32.71 W	134.4 kW	13.88 kSv	57.06 MSv
^{143}Pr	20.87 gm	146.0 mM	5.202×10^{7}	2.493×10^{6}	β	13.56 d	314.3 keV	2.619 kW	125.5 W	62.42 MSv	2.991 MSv
^{144}Pr	17.32 mg	120.4 μM	4.843×10^{7}	2.796×10^{9}	β	17.28 m	1.240 MeV	9.623 kW	555.6 kW	2.421 MSv	139.8 MSv
^{144m}Pr	86.06 μg	598.0 nM	577.6 TBq	6.712×10^{9}	γ	6.900 m	57.74 keV	5.343 W	62.08 kW		
^{145}Pr	268.5 mg	1.853 mM	3.592×10^{7}	1.338×10^{8}	β	5.984 h	691.5 keV	3.979 kW	14.82 kW	14.01 MSv	52.17 MSv
^{146}Pr	14.83 mg	101.6 μM	2.920×10^{7}	1.969×10^{9}	β	24.15 m	2.563 MeV	11.99 kW	808.5 kW		
^{147}Pr	5.914 mg	40.25 μM	2.334×10^{7}	3.947×10^{9}	β	13.40 m	1.568 MeV	5.862 kW	991.2 kW	770.2 kSv	130.2 MSv
^{148}Pr	919.5 μg	6.216 μM	1.880×10^{7}	2.045×10^{10}	β	2.290 m	2.821 MeV	8.497 kW	9.241 MW		
^{149}Pr	660.1 μg	4.432 μM	1.341×10^{7}	2.032×10^{10}	β	2.260 m	1.409 MeV	3.026 kW	4.584 MW		
^{150}Pr	41.17 μg	274.6 nM	9.243×10^{6}	2.245×10^{11}	β	6.100 s	3.213 MeV	4.757 kW	115.5 MW		
^{151}Pr	7.554 μg	50.05 nM	5.221×10^{6}	6.912×10^{11}	β	18.90 s	2.378 MeV	1.989 kW	263.3 MW		
^{152}Pr	7.102 μg	46.74 nM	2.346×10^{6}	3.303×10^{11}	β	3.630 s	3.986 MeV	1.498 kW	210.9 MW		
^{153}Pr	2.143 μg	14.01 nM	755.2 TBq	3.524×10^{11}	β	4.280 s	3.144 MeV	380.4 W	177.5 MW		
^{154}Pr	89.22 ng	579.6 pM	185.1 TBq	2.075×10^{12}	β	2.300 s	4.724 MeV	140.1 W	1.570 GW		
^{155}Pr	25.89 ng	167.1 pM	36.89 TBq	1.425×10^{12}	β	1.000 s	3.883 MeV	22.95 W	886.4 MW		
^{156}Pr	1.321 ng	8.471 pM	6.926 TBq	5.243×10^{12}	β	500.0 ms	5.510 MeV	6.114 W	4.628 GW		
^{157}Pr	262.6 pg	1.673 pM	1.030 TBq	3.922×10^{12}	β	300.0 ms	4.789 MeV	790.2 mW	3.009 GW		
^{158}Pr	7.339 pg	$\leq$ 1 pM	73.78 GBq	1.005×10^{13}	β	200.0 ms	6.318 MeV	74.68 mW	10.18 GW		
^{159}Pr	$\leq$ 1 pg	$\leq$ 1 pM	2.831 GBq	8.361×10^{12}	β	100.0 ms	5.728 MeV	2.598 mW	7.673 GW		
E $_{59}$Pr	1.654 kg	11.74 M	2.445×10^{8}	147.8 TBq				55.01 kW	33.25 W	85.06 MSv	51.42 kSv
^{146}Pm	9.383 mg	64.31 μM	154.6 GBq	16.48 TBq	ϵ	5.531 y	851.1 keV	21.08 mW	2.247 W	139.1 Sv	14.83 kSv
^{147}Pm	146.8 gm	999.2 mM	5.039×10^{6}	34.33 TBq	β	2.623 y	60.49 keV	48.83 W	332.6 mW	1.310 MSv	8.925 kSv
^{148}Pm	1.746 gm	11.80 mM	1.062×10^{7}	6.082×10^{6}	β	5.368 d	1.298 MeV	2.209 kW	1.265 kW	28.67 MSv	16.42 MSv
^{148m}Pm	1.574 gm	10.64 mM	1.245×10^{6}	791.0 TBq	β	41.05 d	2.138 MeV	426.5 W	271.0 W	2.116 MSv	1.345 MSv
^{149}Pm	1.549 gm	10.40 mM	2.272×10^{7}	1.467×10^{7}	β	2.212 d	376.9 keV	1.372 kW	885.7 W	22.49 MSv	14.52 MSv
^{150}Pm	867.1 μg	5.784 μM	250.2 TBq	2.885×10^{8}	β	2.680 h	2.283 MeV	91.52 W	105.5 kW	65.05 kSv	75.02 MSv
^{151}Pm	290.6 mg	1.926 mM	7.863×10^{6}	2.706×10^{7}	β	1.183 d	621.0 keV	782.3 W	2.692 kW	5.740 MSv	19.75 MSv
^{152}Pm	503.5 μg	3.314 μM	5.624×10^{6}	1.117×10^{10}	β	4.120 m	1.727 MeV	1.556 kW	3.090 MW		
^{152m}Pm	17.44 μg	114.8 nM	106.4 TBq	6.101×10^{9}	β	7.520 m	1.708 MeV	29.11 W	1.669 MW		
^{153}Pm	441.8 μg	2.889 μM	3.722×10^{6}	8.425×10^{9}	β	5.250 m	750.0 keV	447.2 W	1.012 MW		
^{154}Pm	134.4 μg	873.1 nM	2.169×10^{6}	1.614×10^{10}	β	1.730 m	2.645 MeV	919.1 W	6.839 MW		
^{154m}Pm	14.78 μg	96.02 nM	371.1 TBq	2.511×10^{10}	β	2.680 m	2.555 MeV	151.9 W	10.28 MW		
^{155}Pm	18.95 μg	122.3 nM	1.396×10^{6}	7.367×10^{10}	β	41.50 s	1.962 MeV	438.7 W	23.15 MW		
^{156}Pm	3.919 μg	25.13 nM	800.7 TBq	2.043×10^{11}	β	26.70 s	3.216 MeV	412.5 W	105.3 MW		
^{157}Pm	10.11 μg	64.42 nM	395.2 TBq	3.909×10^{10}	β	10.56 s	2.627 MeV	166.3 W	16.45 MW		
^{158}Pm	187.9 ng	1.190 nM	130.6 TBq	6.951×10^{11}	β	4.800 s	4.146 MeV	86.75 W	461.7 MW		
^{159}Pm	48.21 ng	303.3 pM	29.93 TBq	6.208×10^{11}	β	3.000 s	3.456 MeV	16.57 W	343.7 MW		
^{160}Pm	1.822 ng	11.39 pM	4.773 TBq	2.620×10^{12}	β	2.000 s	4.894 MeV	3.742 W	2.054 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{161}Pm	250.2 pg	1.555 pM	546.1 GBq	2.183×10^{12}	β	700.0 ms	4.323 MeV	378.2 mW	1.512 GW		
^{162}Pm	3.534 pg	$\leq$ 1 pM	22.78 GBq	6.446×10^{12}	β	500.0 ms	5.817 MeV	21.23 mW	6.007 GW		
E $_{61}$Pm	152.0 gm	1.034 M	6.249×10^{7}	411.2 TBq				9.158 kW	60.26 W	60.40 MSv	397.4 kSv
^{95}Mo	1.004 kg	10.58 M									
^{96}Mo	80.49 gm	839.3 mM									
^{97}Mo	1.201 kg	12.39 M									
^{98}Mo	1.238 kg	12.64 M	1.673 kBq	1.351 Bq	2β	100.0 Ty	112.0 keV	30.01 pW	$\leq$ 1 pW		
^{99}Mo	3.841 gm	38.83 mM	6.819×10^{7}	1.775×10^{7}	β	2.747 d	541.8 keV	5.919 kW	1.541 kW	40.91 MSv	10.65 MSv
^{100}Mo	1.423 kg	14.24 M	19.03 mBq	13.37 μBq	2β	$\geq 10^{18}$ y	3.034 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{101}Mo	13.21 mg	130.9 μM	6.227×10^{7}	4.714×10^{9}	β	14.61 m	1.927 MeV	19.22 kW	1.455 MW	2.553 MSv	193.3 MSv
^{102}Mo	9.847 mg	96.62 μM	6.053×10^{7}	6.147×10^{9}	β	11.30 m	311.0 keV	3.016 kW	306.3 kW		
^{103}Mo	890.1 μg	8.649 μM	6.016×10^{7}	6.759×10^{10}	β	1.132 m	2.293 MeV	22.10 kW	24.83 MW		
^{104}Mo	1.192 mg	11.47 μM	4.988×10^{7}	4.185×10^{10}	β	1.000 m	1.035 MeV	8.269 kW	6.937 MW		
^{105}Mo	492.2 μg	4.691 μM	3.625×10^{7}	7.365×10^{10}	β	35.60 s	3.115 MeV	18.09 kW	36.75 MW		
^{106}Mo	46.26 μg	436.8 nM	2.025×10^{7}	4.377×10^{11}	β	8.730 s	1.795 MeV	5.824 kW	125.9 MW		
^{107}Mo	12.57 μg	117.6 nM	7.674×10^{6}	6.105×10^{11}	β	3.500 s	3.694 MeV	4.541 kW	361.3 MW		
^{108}Mo	804.9 ng	7.458 nM	2.075×10^{6}	2.578×10^{12}	β	1.090 s	2.691 MeV	894.6 W	1.111 GW		
^{109}Mo	168.4 ng	1.546 nM	624.6 TBq	3.709×10^{12}	β	500.0 ms	4.591 MeV	459.4 W	2.728 GW		
^{110}Mo	59.17 ng	538.3 pM	118.7 TBq	2.006×10^{12}	β	300.0 ms	3.509 MeV	66.73 W	1.128 GW		
^{111}Mo	2.486 ng	22.41 pM	23.88 TBq	9.606×10^{12}	β	500.0 ms	5.479 MeV	20.96 W	8.431 GW		
^{112}Mo	802.6 pg	7.170 pM	4.344 TBq	5.412×10^{12}	β	1.000 s	4.332 MeV	3.015 W	3.757 GW		
^{113}Mo	16.46 pg	$\leq$ 1 pM	308.5 GBq	1.874×10^{13}	β	100.0 ms	6.414 MeV	317.0 mW	19.26 GW		
^{114}Mo	2.763 pg	$\leq$ 1 pM	31.48 GBq	1.139×10^{13}	β	80.00 ms	5.197 MeV	26.21 mW	9.486 GW		
^{115}Mo	$\leq$ 1 pg	$\leq$ 1 pM	2.107 GBq	3.131×10^{13}	β	60.00 ms	7.217 MeV	2.436 mW	36.20 GW		
A $_{42}$Mo	4.950 kg	50.74 M	3.681×10^{8}	74.35 TBq				88.42 kW	17.86 W	43.47 MSv	8.781 kSv
^{92}Nb	20.21 pg	$\leq$ 1 pM	104.5 kBq	5.171×10^{6}	ϵ	35.00 My	1.510 MeV	25.28 nW	1.251 kW		
^{93}Nb	126.4 μg	1.361 μM									
^{93m}Nb	891.3 μg	9.594 μM	9.324 GBq	10.46 TBq	γ	16.13 y	29.89 keV	44.65 μW	50.10 mW	1.119 Sv	1.255 kSv
^{94}Nb	1.182 mg	12.59 μM	8.195 MBq	6.933 GBq	β	19.99 ky	1.719 MeV	2.257 μW	1.909 mW	13.93 mSv	11.79 Sv
^{94m}Nb	4.048 ng	43.11 pM	47.88 GBq	1.183×10^{10}	γ	6.260 m	47.10 keV	361.3 μW	89.25 kW		
^{95}Nb	40.07 gm	422.2 mM	5.798×10^{7}	1.447×10^{6}	β	34.99 d	809.4 keV	7.518 kW	187.6 W	33.63 MSv	839.2 kSv
^{95m}Nb	29.14 mg	307.0 μM	410.7 TBq	1.409×10^{7}	γ	3.608 d	234.5 keV	15.43 W	529.5 W	230.0 kSv	7.893 MSv
^{96}Nb	2.463 mg	25.68 μM	127.5 TBq	5.177×10^{7}	β	23.35 h	2.805 MeV	57.29 W	23.26 kW	140.3 kSv	56.94 MSv
^{97}Nb	59.36 mg	612.5 μM	5.909×10^{7}	9.955×10^{8}	β	1.202 h	1.123 MeV	10.63 kW	179.1 kW	4.018 MSv	67.69 MSv
^{97m}Nb	773.2 μg	7.979 μM	5.546×10^{7}	7.173×10^{10}	γ	52.70 s	742.9 keV	6.601 kW	8.537 MW		
^{98}Nb	39.81 μg	406.6 nM	6.061×10^{7}	1.522×10^{12}	β	2.860 s	2.081 MeV	20.21 kW	507.7 MW		
^{98m}Nb	482.5 μg	4.928 μM	665.3 TBq	1.379×10^{9}	β	51.30 m	3.245 MeV	345.9 W	716.9 kW	73.18 kSv	151.7 MSv
^{99}Nb	209.3 μg	2.116 μM	6.175×10^{7}	2.950×10^{11}	β	15.00 s	1.557 MeV	15.40 kW	73.58 MW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{99m}Nb	99.19 μg	1.003 μM	2.682×10^{6}	2.704×10^{10}	β	2.600 m	2.169 MeV	932.0 W	9.396 MW		
^{100}Nb	19.88 μg	199.0 nM	3.459×10^{7}	1.740×10^{12}	β	1.500 s	3.981 MeV	22.06 kW	1.110 GW		
^{100m}Nb	19.96 μg	199.8 nM	3.459×10^{7}	1.733×10^{12}	β	2.900 s	3.485 MeV	19.31 kW	967.4 MW		
^{101}Nb	97.66 μg	967.8 nM	5.768×10^{7}	5.906×10^{11}	β	7.100 s	2.231 MeV	20.62 kW	211.1 MW		
^{102}Nb	36.52 μg	358.3 nM	4.984×10^{7}	1.365×10^{12}	β	1.300 s	4.174 MeV	33.33 kW	912.7 MW		
^{103}Nb	137.2 μg	1.333 μM	3.549×10^{7}	2.587×10^{11}	β	1.500 s	3.118 MeV	17.73 kW	129.2 MW		
^{104}Nb	4.426 μg	42.59 nM	1.777×10^{7}	4.015×10^{12}	β	4.900 s	5.097 MeV	14.51 kW	3.278 GW		
^{105}Nb	2.799 μg	26.68 nM	6.183×10^{6}	2.209×10^{12}	β	2.950 s	3.956 MeV	3.919 kW	1.400 GW		
^{106}Nb	224.4 ng	2.118 nM	1.652×10^{6}	7.362×10^{12}	β	920.0 ms	6.004 MeV	1.589 kW	7.081 GW		
^{107}Nb	44.28 ng	414.1 pM	258.1 TBq	5.829×10^{12}	β	300.0 ms	4.970 MeV	205.5 W	4.641 GW		
^{108}Nb	2.778 ng	25.74 pM	48.36 TBq	1.741×10^{13}	β	193.0 ms	7.015 MeV	54.35 W	19.56 GW		
^{109}Nb	697.3 pg	6.401 pM	9.339 TBq	1.339×10^{13}	β	190.0 ms	5.895 MeV	8.820 W	12.65 GW		
^{110}Nb	34.69 pg	$\leq$ 1 pM	1.047 TBq	3.018×10^{13}	β	170.0 ms	7.828 MeV	1.313 W	37.85 GW		
^{111}Nb	3.686 pg	$\leq$ 1 pM	88.84 GBq	2.410×10^{13}	β	80.00 ms	6.773 MeV	96.40 mW	26.15 GW		
A $_{41}$Nb	40.17 gm	423.2 mM	5.369×10^{8}	1.337×10^{7}				195.0 kW	4.856 kW	38.09 MSv	948.3 kSv
^{142}Nd	51.55 gm	363.3 mM									
^{143}Nd	1.093 kg	7.648 M									
^{144}Nd	1.664 kg	11.56 M	66.79 Bq	40.14 mBq	α	2.290 Py	1.905 MeV	20.39 pW	$\leq$ 1 pW		
^{145}Nd	975.5 gm	6.732 M									
^{146}Nd	1.091 kg	7.477 M									
^{147}Nd	7.896 gm	53.74 mM	2.347×10^{7}	2.972×10^{6}	β	10.98 d	407.2 keV	1.531 kW	193.9 W	25.82 MSv	3.270 MSv
^{148}Nd	563.2 gm	3.808 M	18.65 mBq	33.12 μBq	2β	$\geq 10^{18}$ y	1.929 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{149}Nd	31.98 mg	214.7 μM	1.439×10^{7}	4.500×10^{8}	β	1.728 h	890.1 keV	2.052 kW	64.17 kW	1.727 MSv	54.00 MSv
^{150}Nd	273.6 gm	1.825 M	1.150 mBq	4.201 μBq	2β	$\geq 10^{18}$ y	3.368 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{151}Nd	2.113 mg	14.00 μM	7.851×10^{6}	3.716×10^{9}	β	12.44 m	1.484 MeV	1.866 kW	883.1 kW	235.5 kSv	111.5 MSv
^{152}Nd	1.376 mg	9.057 μM	5.480×10^{6}	3.983×10^{9}	β	11.40 m	561.9 keV	493.3 W	358.5 kW		
^{153}Nd	80.93 μg	529.2 nM	3.271×10^{6}	4.042×10^{10}	β	31.60 s	2.088 MeV	1.094 kW	13.52 MW		
^{154}Nd	25.97 μg	168.7 nM	1.761×10^{6}	6.781×10^{10}	β	25.90 s	1.079 MeV	304.4 W	11.72 MW		
^{155}Nd	6.700 μg	43.24 nM	692.6 TBq	1.034×10^{11}	β	8.900 s	2.553 MeV	283.3 W	42.28 MW		
^{156}Nd	5.595 μg	35.88 nM	256.1 TBq	4.577×10^{10}	β	5.490 s	1.725 MeV	70.76 W	12.65 MW		
^{157}Nd	112.9 ng	719.4 pM	72.41 TBq	6.414×10^{11}	β	2.500 s	3.245 MeV	37.64 W	333.4 MW		
^{158}Nd	32.80 ng	207.7 pM	10.99 TBq	3.351×10^{11}	β	700.0 ms	2.536 MeV	4.465 W	136.1 MW		
^{159}Nd	567.6 pg	3.571 pM	1.059 TBq	1.866×10^{12}	β	500.0 ms	3.958 MeV	671.5 mW	1.183 GW		
^{160}Nd	61.00 pg	$\leq$ 1 pM	75.07 GBq	1.231×10^{12}	β	300.0 ms	3.372 MeV	40.55 mW	664.8 MW		
^{161}Nd	1.089 pg	$\leq$ 1 pM	5.080 GBq	4.665×10^{12}	β	200.0 ms	4.869 MeV	3.963 mW	3.639 GW		
E $_{60}$Nd	5.720 kg	39.47 M	5.726×10^{7}	10.01 TBq				7.738 kW	1.353 W	27.78 MSv	4.857 kSv
^{150}Eu	454.6 ng	3.032 nM	1.114 MBq	2.451 TBq	ϵ	36.36 y	1.540 MeV	274.9 nW	604.7 mW	1.448 mSv	3.186 kSv
^{151}Eu	17.81 mg	119.0 μM	926.2 nBq	52.00 μBq	α	$\geq 10^{18}$ y	1.905 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas											

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{152}Eu	63.01 mg	414.8 μM	403.3 GBq	6.401 TBq	ϵ	13.52 y	1.276 MeV	82.45 mW	1.309 W	564.6 Sv	8.961 kSv
^{152m}Eu	71.01 μg	467.4 nM	5.816 TBq	8.190×10^{7}	β	9.275 h	810.2 keV	754.9 mW	10.63 kW	2.908 kSv	40.95 MSv
^{153}Eu	194.4 gm	1.271 M									
^{154}Eu	65.94 gm	428.4 mM	659.0 TBq	9.994 TBq	β	8.593 y	1.509 MeV	159.3 W	2.416 W	1.318 MSv	19.99 kSv
^{155}Eu	25.82 gm	166.7 mM	444.7 TBq	17.22 TBq	β	4.753 y	122.7 keV	8.739 W	338.5 mW	142.3 kSv	5.511 kSv
^{156}Eu	5.259 gm	33.73 mM	1.073×10^{7}	2.040×10^{6}	β	15.19 d	1.741 MeV	2.993 kW	569.1 W	23.61 MSv	4.489 MSv
^{157}Eu	24.89 mg	158.6 μM	1.210×10^{6}	4.861×10^{7}	β	15.18 h	752.1 keV	145.8 W	5.858 kW	726.0 kSv	29.17 MSv
^{158}Eu	440.9 μg	2.792 μM	423.3 TBq	9.601×10^{8}	β	45.90 m	2.129 MeV	144.4 W	327.5 kW	39.79 kSv	90.25 MSv
^{159}Eu	94.46 μg	594.4 nM	228.4 TBq	2.418×10^{9}	β	18.10 m	1.582 MeV	57.90 W	613.0 kW		
^{160}Eu	2.028 μg	12.68 nM	103.8 TBq	5.118×10^{10}	β	38.00 s	2.268 MeV	37.72 W	18.60 MW		
^{161}Eu	727.2 ng	4.519 nM	44.84 TBq	6.166×10^{10}	β	26.00 s	2.077 MeV	14.92 W	20.52 MW		
^{162}Eu	1.337 μg	8.256 nM	12.77 TBq	9.551×10^{9}	β	10.60 s	3.350 MeV	6.854 W	5.126 MW		
^{163}Eu	16.92 ng	103.8 pM	2.920 TBq	1.726×10^{11}	β	6.000 s	3.008 MeV	1.407 W	83.16 MW		
^{164}Eu	483.3 pg	2.948 pM	567.2 GBq	1.174×10^{12}	β	2.000 s	4.409 MeV	400.6 mW	828.9 MW		
^{165}Eu	86.70 pg	$\leq$ 1 pM	86.10 GBq	9.931×10^{11}	β	1.000 s	3.781 MeV	52.15 mW	601.5 MW		
E $_{63}$Eu	291.5 gm	1.901 M	1.387×10^{7}	47.57 TBq				3.571 kW	12.25 W	25.84 MSv	88.62 kSv
^{121}Sb	12.18 gm	100.7 mM									
^{122}Sb	8.627 mg	70.77 μM	126.6 TBq	1.467×10^{7}	β	2.700 d	1.006 MeV	20.40 W	2.365 kW	215.2 kSv	24.95 MSv
^{122m}Sb	73.16 ng	600.1 pM	993.8 GBq	1.358×10^{10}	γ	4.190 m	162.0 keV	25.79 mW	352.5 kW		
^{123}Sb	14.76 gm	120.1 mM									
^{124}Sb	128.6 mg	1.038 mM	83.25 TBq	647.4 TBq	β	60.20 d	2.240 MeV	29.88 W	232.3 W	208.1 kSv	1.618 MSv
^{124m}Sb	14.32 ng	115.6 pM	518.4 GBq	3.620×10^{10}	γ	1.550 m	433.7 keV	36.02 mW	2.515 MW		
^{125}Sb	19.53 gm	156.4 mM	746.3 TBq	38.21 TBq	β	2.759 y	527.5 keV	63.07 W	3.229 W	820.9 kSv	42.03 kSv
^{126}Sb	17.14 mg	136.1 μM	53.02 TBq	3.093×10^{6}	β	12.40 d	3.117 MeV	26.48 W	1.545 kW	127.2 kSv	7.424 MSv
^{126m}Sb	7.056 μg	56.04 nM	20.52 TBq	2.908×10^{9}	β	19.10 m	2.148 MeV	7.060 W	1.001 MW	738.7 Sv	104.7 MSv
^{127}Sb	438.4 mg	3.454 mM	4.333×10^{6}	9.884×10^{6}	β	3.850 d	1.001 MeV	695.0 W	1.585 kW	7.366 MSv	16.80 MSv
^{128}Sb	5.954 mg	46.55 μM	598.7 TBq	1.006×10^{8}	β	9.010 h	3.482 MeV	334.0 W	56.10 kW	455.0 kSv	76.42 MSv
^{128m}Sb	1.301 mg	10.17 μM	6.804×10^{6}	5.230×10^{9}	β	10.40 m	2.960 MeV	3.226 kW	2.480 MW	224.5 kSv	172.6 MSv
^{129}Sb	59.69 mg	463.0 μM	1.242×10^{7}	2.081×10^{8}	β	4.360 h	1.886 MeV	3.752 kW	62.86 kW	5.216 MSv	87.39 MSv
^{130}Sb	3.048 mg	23.46 μM	4.077×10^{6}	1.338×10^{9}	β	39.50 m	3.952 MeV	2.581 kW	846.8 kW	371.0 kSv	121.7 MSv
^{130m}Sb	2.056 mg	15.83 μM	1.747×10^{7}	8.497×10^{9}	β	6.300 m	3.716 MeV	10.40 kW	5.058 MW		
^{131}Sb	13.09 mg	99.99 μM	3.025×10^{7}	2.311×10^{9}	β	23.03 m	2.441 MeV	11.83 kW	903.7 kW	3.025 MSv	231.1 MSv
^{132}Sb	931.5 μg	7.061 μM	1.754×10^{7}	1.883×10^{10}	β	2.790 m	3.936 MeV	11.06 kW	11.87 MW		
^{132m}Sb	931.4 μg	7.061 μM	1.169×10^{7}	1.255×10^{10}	β	4.100 m	3.932 MeV	7.364 kW	7.906 MW		
^{133}Sb	903.3 μg	6.796 μM	1.970×10^{7}	2.181×10^{10}	β	2.500 m	3.698 MeV	11.67 kW	12.92 MW		
^{134}Sb	12.36 μg	92.29 nM	3.502×10^{6}	2.833×10^{11}	β	780.0 ms	4.930 MeV	2.766 kW	223.8 MW		
^{134m}Sb	11.15 μg	83.26 nM	3.247×10^{6}	2.912×10^{11}	β	10.07 s	5.048 MeV	2.626 kW	235.5 MW		
^{135}Sb	996.9 ng	7.389 nM	1.814×10^{6}	1.820×10^{12}	β	1.740 s	4.872 MeV	1.416 kW	1.420 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{136}Sb	27.31 ng	200.9 pM	362.5 TBq	1.327×10^{13}	β	923.0 ms	6.576 MeV	381.9 W	13.98 GW		
^{137}Sb	5.174 ng	37.78 pM	55.61 TBq	1.075×10^{13}	β	450.0 ms	5.845 MeV	52.07 W	10.06 GW		
^{138}Sb	300.3 pg	2.177 pM	6.971 TBq	2.321×10^{13}	β	500.0 ms	7.447 MeV	8.317 W	27.70 GW		
^{139}Sb	29.49 pg	$\leq$ 1 pM	515.4 GBq	1.748×10^{13}	β	300.0 ms	6.495 MeV	536.3 mW	18.19 GW		
E $_{51}$Sb	47.15 gm	382.6 mM	1.349×10^{8}	2.861×10^{6}				70.31 kW	1.491 kW	18.03 MSv	382.4 kSv
^{146}Sm	10.19 mg	69.84 μM	13.20 kBq	1.295 MBq	α	100.0 My	2.540 MeV	5.371 nW	527.1 nW	712.8 μSv	69.95 mSv
^{147}Sm	89.07 gm	606.3 mM	74.92 kBq	841.1 Bq	α	106.0 Gy	2.310 MeV	27.73 nW	311.3 pW	3.671 mSv	41.22 μSv
^{148}Sm	306.2 gm	2.070 M	3.421 Bq	11.17 mBq	α	7.000 Py	2.014 MeV	1.104 pW	$\leq$ 1 pW		
^{149}Sm	3.034 gm	20.37 mM	134.7 mBq	44.41 mBq	α	2.000 Py	1.870 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{150}Sm	478.3 gm	3.190 M									
^{151}Sm	22.53 gm	149.3 mM	21.94 TBq	973.8 GBq	β	90.00 y	19.78 keV	69.52 mW	3.086 mW	2.150 kSv	95.43 Sv
^{152}Sm	178.2 gm	1.173 M									
^{153}Sm	1.392 gm	9.103 mM	2.260×10^{7}	1.624×10^{7}	β	1.928 d	330.9 keV	1.198 kW	860.6 W	16.72 MSv	12.01 MSv
^{154}Sm	59.76 gm	388.2 mM									
^{155}Sm	834.3 μg	5.385 μM	1.688×10^{6}	2.023×10^{9}	β	22.30 m	983.6 keV	266.0 W	318.8 kW	48.95 kSv	58.67 MSv
^{156}Sm	13.46 mg	86.32 μM	1.065×10^{6}	7.912×10^{7}	β	9.400 h	427.1 keV	72.87 W	5.414 kW	266.3 kSv	19.78 MSv
^{157}Sm	129.0 μg	822.0 nM	714.8 TBq	5.541×10^{9}	β	8.030 m	1.521 MeV	174.2 W	1.350 MW		
^{158}Sm	394.7 μg	2.499 μM	395.2 TBq	1.001×10^{9}	β	5.300 m	707.1 keV	44.77 W	113.4 kW		
^{159}Sm	11.66 μg	73.36 nM	188.9 TBq	1.620×10^{10}	β	11.37 s	1.977 MeV	59.82 W	5.130 MW		
^{160}Sm	9.073 μg	56.73 nM	67.82 TBq	7.475×10^{9}	β	9.600 s	1.791 MeV	19.46 W	2.145 MW		
^{161}Sm	91.56 ng	568.9 pM	18.44 TBq	2.014×10^{11}	β	4.800 s	2.746 MeV	8.112 W	88.60 MW		
^{162}Sm	17.38 ng	107.3 pM	2.287 TBq	1.316×10^{11}	β	2.400 s	2.179 MeV	798.2 mW	45.93 MW		
^{163}Sm	247.2 pg	1.517 pM	247.1 GBq	9.996×10^{11}	β	1.000 s	3.579 MeV	141.7 mW	573.2 MW		
^{164}Sm	34.37 pg	$\leq$ 1 pM	20.61 GBq	5.997×10^{11}	β	500.0 ms	2.937 MeV	9.696 mW	282.1 MW		
^{165}Sm	$\leq$ 1 pg	$\leq$ 1 pM	1.243 GBq	2.729×10^{12}	β	200.0 ms	4.389 MeV	874.0 μW	1.919 GW		
E $_{62}$Sm	1.139 kg	7.607 M	2.676×10^{7}	23.51 TBq				1.844 kW	1.620 W	17.04 MSv	14.97 kSv
^{102}Rh	1.540 mg	15.11 μM	68.89 GBq	44.73 TBq	ϵ	2.902 y	2.152 MeV	23.75 mW	15.42 W	82.67 Sv	53.68 kSv
^{103}Rh	559.4 gm	5.436 M									
^{103m}Rh	46.30 mg	449.9 μM	5.576×10^{7}	1.204×10^{9}	γ	56.11 m	38.82 keV	346.8 W	7.490 kW	211.9 kSv	4.576 MSv
^{104}Rh	489.8 μg	4.714 μM	4.651×10^{7}	9.496×10^{10}	β	42.30 s	997.2 keV	7.430 kW	15.17 MW		
^{104m}Rh	197.3 μg	1.899 μM	3.043×10^{6}	1.542×10^{10}	γ	4.340 m	140.0 keV	68.25 W	345.9 kW		
^{105}Rh	1.352 gm	12.89 mM	4.225×10^{7}	3.125×10^{7}	β	1.473 d	230.9 keV	1.563 kW	1.156 kW	15.63 MSv	11.56 MSv
^{105m}Rh	144.9 μg	1.381 μM	1.281×10^{7}	8.841×10^{10}	γ	40.00 s	128.9 keV	264.5 W	1.825 MW		
^{106}Rh	229.3 μg	2.165 μM	3.022×10^{7}	1.318×10^{11}	β	30.00 s	1.618 MeV	7.833 kW	34.16 MW		
^{106m}Rh	2.217 mg	20.93 μM	1.103×10^{6}	4.975×10^{8}	β	2.200 h	3.214 MeV	567.9 W	256.2 kW	176.5 kSv	79.60 MSv
^{107}Rh	9.378 mg	87.72 μM	2.811×10^{7}	2.997×10^{9}	β	21.70 m	807.0 keV	3.634 kW	387.5 kW	674.6 kSv	71.94 MSv
^{108}Rh	85.41 μg	791.5 nM	1.966×10^{7}	2.302×10^{11}	β	16.80 s	2.332 MeV	7.345 kW	86.00 MW		
^{108m}Rh	16.64 μg	154.2 nM	181.8 TBq	1.093×10^{10}	β	6.000 m	3.179 MeV	92.58 W	5.564 MW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{109}Rh	292.4 μg	2.685 μM	1.245×10^{7}	4.258×10^{10}	β	1.333 m	1.275 MeV	2.543 kW	8.697 MW		
^{109m}Rh	81.22 μg	752.2 nM	6.223×10^{6}	7.662×10^{10}	γ	50.00 s	250.1 keV	249.3 W	3.069 MW		
^{110}Rh	42.86 μg	390.0 nM	5.609×10^{6}	1.309×10^{11}	β	28.50 s	3.615 MeV	3.248 kW	75.78 MW		
^{110m}Rh	325.1 ng	2.958 nM	411.4 TBq	1.265×10^{12}	β	3.200 s	2.537 MeV	167.2 W	514.3 MW		
^{111}Rh	51.30 μg	462.5 nM	3.064×10^{6}	5.973×10^{10}	β	12.00 s	2.276 MeV	1.117 kW	21.77 MW		
^{112}Rh	1.883 μg	16.83 nM	1.494×10^{6}	7.934×10^{11}	β	2.100 s	4.073 MeV	974.9 W	517.7 MW		
^{113}Rh	249.1 ng	2.206 nM	1.023×10^{6}	4.107×10^{12}	β	2.800 s	3.012 MeV	493.7 W	1.982 GW		
^{114}Rh	263.4 ng	2.312 nM	567.6 TBq	2.155×10^{12}	β	1.850 s	4.857 MeV	441.7 W	1.677 GW		
^{115}Rh	690.8 ng	6.011 nM	416.6 TBq	6.031×10^{11}	β	990.0 ms	3.785 MeV	252.6 W	365.7 MW		
^{116}Rh	45.30 ng	390.8 pM	195.7 TBq	4.320×10^{12}	β	680.0 ms	5.738 MeV	179.9 W	3.971 GW		
^{117}Rh	30.64 ng	262.0 pM	101.6 TBq	3.316×10^{12}	β	440.0 ms	4.590 MeV	74.71 W	2.438 GW		
^{118}Rh	13.49 ng	114.4 pM	161.7 TBq	1.199×10^{13}	β	320.0 ms	6.690 MeV	173.3 W	12.85 GW		
^{119}Rh	1.717 ng	14.44 pM	13.46 TBq	7.839×10^{12}	β	300.0 ms	5.315 MeV	11.46 W	6.674 GW		
^{120}Rh	92.43 pg	$\leq$ 1 pM	1.981 TBq	2.143×10^{13}	β	170.0 ms	7.383 MeV	2.343 W	25.35 GW		
^{121}Rh	20.02 pg	$\leq$ 1 pM	312.7 GBq	1.562×10^{13}	β	250.0 ms	6.232 MeV	312.2 mW	15.59 GW		
^{122}Rh	1.164 pg	$\leq$ 1 pM	37.81 GBq	3.248×10^{13}	β	50.00 ms	7.974 MeV	48.30 mW	41.49 GW		
^{123}Rh	$\leq$ 1 pg	$\leq$ 1 pM	3.219 GBq	2.543×10^{13}	β	42.00 ms	6.919 MeV	3.568 mW	28.18 GW		
A $_{45}$Rh	560.8 gm	5.450 M	2.714×10^{8}	483.9 TBq				39.07 kW	69.67 W	16.70 MSv	29.77 kSv
^{104}Pd	463.0 gm	4.456 M									
^{105}Pd	608.2 gm	5.798 M									
^{106}Pd	369.5 gm	3.489 M									
^{107}Pd	361.2 gm	3.379 M	6.875 GBq	19.03 MBq	β	6.500 My	10.01 keV	11.02 μW	30.51 nW	254.4 mSv	704.2 μSv
^{107m}Pd	27.75 ng	259.6 pM	5.084 TBq	1.832×10^{11}	γ	21.30 s	210.1 keV	171.1 mW	6.166 MW		
^{108}Pd	248.7 gm	2.305 M									
^{109}Pd	204.2 mg	1.875 mM	1.614×10^{7}	7.904×10^{7}	β	13.70 h	448.6 keV	1.160 kW	5.681 kW	8.877 MSv	43.47 MSv
^{109m}Pd	461.3 μg	4.236 μM	6.283×10^{6}	1.362×10^{10}	γ	4.690 m	188.0 keV	189.2 W	410.1 kW		
^{110}Pd	82.30 gm	748.8 mM	16.51 mBq	200.6 μBq	2β	600.0 Py	2.000 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{111}Pd	1.110 mg	10.01 μM	3.162×10^{6}	2.849×10^{9}	β	23.40 m	897.2 keV	454.5 W	409.5 kW		
^{111m}Pd	261.8 μg	2.361 μM	49.77 TBq	1.901×10^{8}	γ	5.500 h	587.8 keV	4.687 W	17.90 kW		
^{112}Pd	31.11 mg	278.0 μM	1.603×10^{6}	5.153×10^{7}	β	20.30 h	155.0 keV	39.81 W	1.280 kW		
^{113}Pd	30.19 μg	267.4 nM	1.240×10^{6}	4.107×10^{10}	β	1.517 m	1.985 MeV	394.4 W	13.06 MW		
^{114}Pd	32.59 μg	286.1 nM	829.2 TBq	2.544×10^{10}	β	2.420 m	1.173 MeV	155.8 W	4.781 MW		
^{115}Pd	8.101 μg	70.50 nM	774.0 TBq	9.554×10^{10}	β	25.00 s	2.580 MeV	319.9 W	39.49 MW		
^{116}Pd	2.238 μg	19.31 nM	575.4 TBq	2.571×10^{11}	β	11.80 s	1.569 MeV	144.6 W	64.61 MW		
^{117}Pd	698.8 ng	5.977 nM	498.8 TBq	7.138×10^{11}	β	4.300 s	3.369 MeV	269.2 W	385.2 MW		
^{118}Pd	363.6 ng	3.083 nM	415.1 TBq	1.142×10^{12}	β	1.900 s	2.256 MeV	150.0 W	412.5 MW		
^{119}Pd	151.0 ng	1.270 nM	309.6 TBq	2.050×10^{12}	β	920.0 ms	4.282 MeV	212.4 W	1.407 GW		
^{120}Pd	139.2 ng	1.161 nM	113.4 TBq	8.147×10^{11}	β	500.0 ms	2.951 MeV	53.61 W	385.1 MW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{121}Pd	7.973 ng	65.93 pM	44.25 TBq	5.550×10^{12}	β	600.0 ms	4.957 MeV	35.14 W	4.407 GW		
^{122}Pd	5.021 ng	41.18 pM	13.53 TBq	2.695×10^{12}	β	300.0 ms	3.767 MeV	8.165 W	1.626 GW		
^{123}Pd	278.3 pg	2.264 pM	3.048 TBq	1.095×10^{13}	β	200.0 ms	5.689 MeV	2.778 W	9.982 GW		
^{124}Pd	95.57 pg	$\leq$ 1 pM	574.6 GBq	6.012×10^{12}	β	100.0 ms	4.518 MeV	415.9 mW	4.352 GW		
^{126}Pd	$\leq$ 1 pg	$\leq$ 1 pM	8.787 GBq	1.155×10^{13}	β	48.60 ms	5.334 MeV	7.509 mW	9.866 GW		
A $_{46}$Pd	2.133 kg	20.18 M	3.206×10^{7}	15.03 TBq				3.595 kW	1.685 W	8.877 MSv	4.161 kSv
^{98}Tc	10.77 mg	110.0 μM	346.4 kBq	32.16 MBq	β	4.200 My	1.532 MeV	85.02 nW	7.894 μW	692.8 μSv	64.33 mSv
^{99}Tc	1.132 kg	11.45 M	710.0 GBq	627.2 MBq	β	214.0 ky	84.62 keV	9.625 mW	8.503 μW	454.4 Sv	401.4 mSv
^{99m}Tc	306.7 mg	3.101 mM	5.972×10^{7}	1.947×10^{8}	γ	6.010 h	142.1 keV	1.360 kW	4.434 kW	1.314 MSv	4.284 MSv
^{100}Tc	88.84 μg	889.2 nM	2.348×10^{7}	2.643×10^{11}	β	15.80 s	1.485 MeV	5.586 kW	62.88 MW		
^{101}Tc	12.83 mg	127.1 μM	6.227×10^{7}	4.853×10^{9}	β	14.20 m	809.8 keV	8.079 kW	629.7 kW	1.183 MSv	92.22 MSv
^{102}Tc	78.17 μg	767.1 nM	6.061×10^{7}	7.754×10^{11}	β	5.280 s	1.740 MeV	16.90 kW	216.2 MW		
^{102m}Tc	4.937 μg	48.45 nM	77.44 TBq	1.569×10^{10}	β	4.350 m	3.202 MeV	39.73 W	8.047 MW		
^{103}Tc	754.0 μg	7.327 μM	6.116×10^{7}	8.111×10^{10}	β	54.20 s	1.227 MeV	12.02 kW	15.94 MW		
^{104}Tc	14.52 mg	139.7 μM	5.339×10^{7}	3.677×10^{9}	β	18.30 m	3.669 MeV	31.38 kW	2.161 MW	4.271 MSv	294.2 MSv
^{105}Tc	5.406 mg	51.53 μM	4.481×10^{7}	8.289×10^{9}	β	7.600 m	1.861 MeV	13.36 kW	2.471 MW		
^{106}Tc	306.7 μg	2.896 μM	3.266×10^{7}	1.065×10^{11}	β	36.00 s	3.887 MeV	20.34 kW	66.32 MW		
^{107}Tc	138.4 μg	1.294 μM	1.863×10^{7}	1.346×10^{11}	β	21.20 s	2.801 MeV	8.361 kW	60.41 MW		
^{108}Tc	14.42 μg	133.6 nM	1.072×10^{7}	7.434×10^{11}	β	5.170 s	4.622 MeV	7.938 kW	550.5 MW		
^{109}Tc	64.07 μg	588.2 nM	4.814×10^{6}	7.514×10^{10}	β	860.0 ms	3.723 MeV	2.871 kW	44.81 MW		
^{110}Tc	255.3 ng	2.323 nM	1.168×10^{6}	4.575×10^{12}	β	920.0 ms	5.638 MeV	1.055 kW	4.132 GW		
^{111}Tc	127.4 ng	1.149 nM	358.8 TBq	2.816×10^{12}	β	290.0 ms	4.567 MeV	262.5 W	2.060 GW		
^{112}Tc	11.07 ng	98.90 pM	116.1 TBq	1.049×10^{13}	β	290.0 ms	6.554 MeV	121.9 W	11.01 GW		
^{113}Tc	3.772 ng	33.40 pM	30.42 TBq	8.065×10^{12}	β	130.0 ms	5.427 MeV	26.45 W	7.012 GW		
^{114}Tc	319.9 pg	2.808 pM	6.760 TBq	2.113×10^{13}	β	200.0 ms	7.480 MeV	8.101 W	25.32 GW		
^{115}Tc	87.01 pg	$\leq$ 1 pM	1.420 TBq	1.632×10^{13}	β	270.0 ms	6.326 MeV	1.439 W	16.54 GW		
^{116}Tc	2.595 pg	$\leq$ 1 pM	87.95 GBq	3.389×10^{13}	β	120.0 ms	8.261 MeV	116.4 mW	44.86 GW		
^{117}Tc	$\leq$ 1 pg	$\leq$ 1 pM	3.730 GBq	2.640×10^{13}	β	40.00 ms	7.024 MeV	4.197 mW	29.70 GW		
A $_{43}$Tc	1.132 kg	11.45 M	4.340×10^{8}	383.3 TBq				129.7 kW	114.5 W	6.769 MSv	5.977 kSv
^{106}Ag	7.102 pg	$\leq$ 1 pM	38.11 kBq	5.366×10^{6}	ϵ	24.00 m	1.219 MeV	7.440 nW	1.048 kW	1.220 μSv	171.7 kSv
^{107}Ag	52.94 μg	495.2 nM									
^{108}Ag	3.215 ng	29.79 pM	87.43 GBq	2.719×10^{10}	β	2.400 m	628.1 keV	8.797 mW	2.736 MW		
^{108m}Ag	1.919 μg	17.78 nM	1.851 MBq	964.6 GBq	ϵ	418.0 y	1.634 MeV	484.6 nW	252.5 mW	4.257 mSv	2.218 kSv
^{109}Ag	115.2 gm	1.058 M									
^{109m}Ag	166.8 μg	1.532 μM	1.614×10^{7}	9.676×10^{10}	γ	39.70 s	86.94 keV	224.8 W	1.348 MW		
^{110}Ag	59.10 μg	537.7 nM	9.121×10^{6}	1.543×10^{11}	β	24.56 s	1.212 MeV	1.771 kW	29.97 MW		
^{110m}Ag	1.550 gm	14.10 mM	272.5 TBq	175.8 TBq	β	249.8 d	2.817 MeV	123.0 W	79.35 W	763.0 kSv	492.3 kSv
^{111}Ag	549.3 mg	4.953 mM	3.210×10^{6}	5.844×10^{6}	β	7.450 d	378.0 keV	194.4 W	353.9 W	4.173 MSv	7.597 MSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{111m}Ag	54.79 μg	494.0 nM	3.171×10^{6}	5.788×10^{10}	γ	1.080 m	65.00 keV	33.02 W	602.7 kW		
^{112}Ag	4.861 mg	43.44 μM	1.608×10^{6}	3.308×10^{8}	β	3.130 h	2.093 MeV	539.3 W	110.9 kW	691.4 kSv	142.2 MSv
^{113}Ag	5.770 mg	51.10 μM	1.117×10^{6}	1.936×10^{8}	β	5.370 h	1.053 MeV	188.5 W	32.67 kW		
^{113m}Ag	2.246 μg	19.89 nM	125.8 TBq	5.601×10^{10}	γ	1.145 m	1.180 MeV	23.79 W	10.59 MW		
^{114}Ag	1.038 μg	9.113 nM	841.0 TBq	8.102×10^{11}	β	4.600 s	2.050 MeV	276.2 W	266.1 MW		
^{115}Ag	191.9 μg	1.670 μM	580.9 TBq	3.027×10^{9}	β	20.00 m	1.725 MeV	160.5 W	836.4 kW	34.85 kSv	181.6 MSv
^{115m}Ag	1.049 μg	9.129 nM	224.2 TBq	2.137×10^{11}	β	18.60 s	1.908 MeV	68.52 W	65.32 MW		
^{116}Ag	14.40 μg	124.2 nM	322.5 TBq	2.240×10^{10}	β	2.680 m	3.424 MeV	176.9 W	12.28 MW		
^{116m}Ag	931.5 ng	8.036 nM	322.5 TBq	3.462×10^{11}	β	8.600 s	4.010 MeV	207.2 W	222.4 MW		
^{117}Ag	6.443 μg	55.11 nM	314.2 TBq	4.877×10^{10}	β	1.227 m	2.479 MeV	124.8 W	19.37 MW		
^{117m}Ag	466.4 ng	3.989 nM	314.1 TBq	6.735×10^{11}	β	5.340 s	2.599 MeV	130.8 W	280.4 MW		
^{118}Ag	433.8 ng	3.679 nM	414.8 TBq	9.562×10^{11}	β	3.760 s	3.186 MeV	211.7 W	488.0 MW		
^{118m}Ag	228.1 ng	1.934 nM	288.3 TBq	1.264×10^{12}	β	2.000 s	2.123 MeV	98.06 W	429.9 MW		
^{119}Ag	993.3 ng	8.353 nM	580.9 TBq	5.848×10^{11}	β	6.000 s	3.181 MeV	296.0 W	298.0 MW		
^{120}Ag	132.6 ng	1.106 nM	394.4 TBq	2.974×10^{12}	β	1.230 s	2.569 MeV	162.3 W	1.224 GW		
^{121}Ag	237.2 ng	1.962 nM	272.9 TBq	1.151×10^{12}	β	780.0 ms	3.863 MeV	168.9 W	712.1 MW		
^{122}Ag	4.923 ng	40.38 pM	168.5 TBq	3.423×10^{13}	β	480.0 ms	5.879 MeV	158.7 W	32.24 GW		
^{123}Ag	22.25 ng	181.0 pM	87.58 TBq	3.936×10^{12}	β	310.0 ms	4.698 MeV	65.92 W	2.963 GW		
^{124}Ag	3.204 ng	25.85 pM	40.18 TBq	1.254×10^{13}	β	172.0 ms	6.633 MeV	42.70 W	13.33 GW		
^{125}Ag	1.452 ng	11.62 pM	12.69 TBq	8.740×10^{12}	β	166.0 ms	5.480 MeV	11.14 W	7.672 GW		
^{126}Ag	186.7 pg	1.483 pM	3.981 TBq	2.132×10^{13}	β	107.0 ms	7.264 MeV	4.633 W	24.82 GW		
^{128}Ag	5.448 pg	$\leq$ 1 pM	173.6 GBq	3.186×10^{13}	β	58.00 ms	7.892 MeV	219.5 mW	40.29 GW		
E $_{47}$Ag	117.3 gm	1.077 M	3.995×10^{7}	340.5 TBq				5.463 kW	46.57 W	5.662 MSv	48.27 kSv
^{114}Sn	3.606 mg	31.66 μM									
^{115}Sn	488.7 mg	4.253 mM									
^{116}Sn	12.26 gm	105.8 mM									
^{117}Sn	12.64 gm	108.1 mM									
^{117m}Sn	1.996 mg	17.07 μM	5.887 TBq	2.949×10^{6}	γ	13.60 d	312.9 keV	295.1 mW	147.8 W	4.180 kSv	2.094 MSv
^{118}Sn	12.81 gm	108.7 mM									
^{119}Sn	12.69 gm	106.7 mM									
^{119m}Sn	67.37 mg	566.6 μM	11.17 TBq	165.8 TBq	γ	293.0 d	87.18 keV	156.0 mW	2.316 W	3.798 kSv	56.37 kSv
^{120}Sn	12.99 gm	108.3 mM									
^{121}Sn	18.28 mg	151.2 μM	654.2 TBq	3.579×10^{7}	β	1.126 d	204.0 keV	21.38 W	1.170 kW	150.5 kSv	8.231 MSv
^{121m}Sn	5.494 mg	45.44 μM	12.02 GBq	2.188 TBq	γ	55.00 y	338.1 keV	651.0 μW	118.5 mW	4.568 Sv	831.4 Sv
^{122}Sn	14.26 gm	117.0 mM									
^{123}Sn	489.5 mg	3.983 mM	148.9 TBq	304.2 TBq	β	129.2 d	526.9 keV	12.57 W	25.68 W	312.7 kSv	638.8 kSv
^{123m}Sn	433.4 μg	3.526 μM	611.6 TBq	1.411×10^{9}	β	40.06 m	615.0 keV	60.26 W	139.0 kW	23.24 kSv	53.62 MSv
^{124}Sn	19.24 gm	155.3 mM	20.54 mBq	1.068 mBq	2β	100.0 Py	2.287 MeV	$\leq$ 1 pW	$\leq$ 1 pW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{125}Sn	135.3 mg	1.083 mM	542.8 TBq	4.012×10^{6}	β	9.640 d	1.118 MeV	97.19 W	718.3 W	1.683 MSv	12.44 MSv
^{125m}Sn	151.0 μg	1.209 μM	883.6 TBq	5.852×10^{9}	β	9.520 m	1.135 MeV	160.6 W	1.064 MW		
^{126}Sn	42.50 gm	337.6 mM	44.62 GBq	1.050 GBq	β	230.0 ky	210.4 keV	1.504 mW	35.39 μW	209.7 Sv	4.934 Sv
^{127}Sn	6.322 mg	49.81 μM	2.750×10^{6}	4.350×10^{8}	β	2.100 h	2.442 MeV	1.076 kW	170.2 kW	550.0 kSv	87.00 MSv
^{127m}Sn	98.32 μg	774.7 nM	1.304×10^{6}	1.326×10^{10}	β	4.130 m	1.628 MeV	340.0 W	3.458 MW		
^{128}Sn	6.746 mg	52.74 μM	6.216×10^{6}	9.214×10^{8}	β	59.07 m	814.1 keV	810.7 W	120.2 kW	932.4 kSv	138.2 MSv
^{129}Sn	592.2 μg	4.594 μM	4.259×10^{6}	7.192×10^{9}	β	2.230 m	2.531 MeV	1.727 kW	2.916 MW		
^{129m}Sn	214.5 μg	1.664 μM	4.629×10^{6}	2.158×10^{10}	β	7.200 m	2.687 MeV	1.993 kW	9.291 MW		
^{130}Sn	914.1 μg	7.036 μM	1.316×10^{7}	1.440×10^{10}	β	3.730 m	1.315 MeV	2.772 kW	3.032 MW		
^{131}Sn	221.9 μg	1.695 μM	1.123×10^{7}	5.061×10^{10}	β	56.00 s	3.012 MeV	5.418 kW	24.42 MW		
^{132}Sn	73.58 μg	557.8 nM	5.820×10^{6}	7.910×10^{10}	β	39.70 s	2.061 MeV	1.922 kW	26.12 MW		
^{133}Sn	811.5 ng	6.105 nM	1.733×10^{6}	2.136×10^{12}	β	1.450 s	4.888 MeV	1.357 kW	1.672 GW		
^{134}Sn	69.01 ng	515.3 pM	254.6 TBq	3.689×10^{12}	β	1.050 s	4.136 MeV	168.7 W	2.445 GW		
^{135}Sn	2.630 ng	19.49 pM	27.95 TBq	1.063×10^{13}	β	530.0 ms	5.641 MeV	25.26 W	9.605 GW		
^{136}Sn	334.5 pg	2.461 pM	2.487 TBq	7.435×10^{12}	β	250.0 ms	4.897 MeV	1.951 W	5.833 GW		
E $_{50}$Sn	140.6 gm	1.158 M	5.424×10^{7}	385.8 TBq				17.96 kW	127.8 W	3.660 MSv	26.03 kSv
^{85}Rb	146.3 gm	1.723 M									
^{86}Rb	36.52 mg	425.1 μM	110.0 TBq	3.012×10^{6}	β	18.64 d	762.7 keV	13.44 W	368.0 W	308.0 kSv	8.434 MSv
^{86m}Rb	139.1 ng	1.619 nM	11.06 TBq	7.951×10^{10}	γ	1.017 m	560.0 keV	992.2 mW	7.133 MW		
^{87}Rb	361.8 gm	4.163 M	1.172 MBq	3.239 kBq	β	48.10 Gy	141.0 keV	26.47 nW	73.16 pW	1.758 mSv	4.859 μSv
^{88}Rb	4.798 mg	54.58 μM	2.132×10^{7}	4.444×10^{9}	β	17.80 m	2.684 MeV	9.168 kW	1.911 MW	1.919 MSv	399.9 MSv
^{89}Rb	5.258 mg	59.14 μM	2.705×10^{7}	5.145×10^{9}	β	15.40 m	3.099 MeV	13.43 kW	2.554 MW	1.271 MSv	241.8 MSv
^{90}Rb	856.7 μg	9.528 μM	2.598×10^{7}	3.033×10^{10}	β	2.633 m	4.022 MeV	16.74 kW	19.54 MW		
^{90m}Rb	358.9 μg	3.992 μM	6.453×10^{6}	1.798×10^{10}	β	4.300 m	4.473 MeV	4.624 kW	12.88 MW		
^{91}Rb	421.8 μg	4.639 μM	3.326×10^{7}	7.885×10^{10}	β	58.40 s	4.067 MeV	21.67 kW	51.38 MW		
^{92}Rb	29.22 μg	317.9 nM	2.961×10^{7}	1.013×10^{12}	β	4.492 s	3.733 MeV	17.71 kW	606.1 MW		
^{93}Rb	29.46 μg	317.0 nM	2.281×10^{7}	7.743×10^{11}	β	5.800 s	3.443 MeV	12.58 kW	427.0 MW		
^{94}Rb	7.394 μg	78.72 nM	1.221×10^{7}	1.651×10^{12}	β	2.702 s	4.735 MeV	9.263 kW	1.253 GW		
^{95}Rb	488.9 ng	5.150 nM	5.968×10^{6}	1.221×10^{13}	β	381.0 ms	4.524 MeV	4.325 kW	8.846 GW		
^{96}Rb	86.77 ng	904.5 pM	1.823×10^{6}	2.101×10^{13}	β	199.0 ms	6.174 MeV	1.803 kW	20.78 GW		
^{97}Rb	14.02 ng	144.6 pM	355.0 TBq	2.532×10^{13}	β	169.9 ms	5.231 MeV	297.5 W	21.22 GW		
^{98}Rb	2.636 ng	26.91 pM	80.22 TBq	3.043×10^{13}	β	114.0 ms	6.806 MeV	87.47 W	33.18 GW		
^{99}Rb	146.5 pg	1.481 pM	8.129 TBq	5.549×10^{13}	β	50.30 ms	6.022 MeV	7.842 W	53.53 GW		
^{100}Rb	17.37 pg	$\leq$ 1 pM	720.8 GBq	4.150×10^{13}	β	51.00 ms	8.460 MeV	976.9 mW	56.24 GW		
E $_{37}$Rb	508.1 gm	5.886 M	1.870×10^{8}	368.1 TBq				111.7 kW	219.9 W	3.498 MSv	6.884 kSv
^{108}Cd	694.2 μg	6.434 μM	207.6 nBq	299.0 μBq	ϵ	410.0 Py	272.0 keV	$\leq$ 1 pW	$\leq$ 1 pW		
^{109}Cd	1.068 μg	9.807 nM	102.0 MBq	95.51 TBq	ϵ	1.267 y	19.61 keV	320.4 nW	300.0 mW	204.0 mSv	191.0 kSv
^{110}Cd	75.69 gm	688.7 mM									

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{111}Cd	45.17 gm	407.3 mM									
^{111m}Cd	1.704 μg	15.36 nM	2.194 TBq	1.288×10^{9}	γ	48.54 m	396.0 keV	139.2 mW	81.69 kW		
^{112}Cd	26.93 gm	240.7 mM									
^{113}Cd	206.3 mg	1.827 mM	3.139 mBq	15.22 mBq	β	7.700 Py	93.30 keV	$\leq$ 1 pW	$\leq$ 1 pW	78.47 pSv	380.4 pSv
^{113m}Cd	444.0 mg	3.933 mM	3.564 TBq	8.027 TBq	β	14.10 y	284.1 keV	162.2 mW	365.3 mW	81.97 kSv	184.6 kSv
^{114}Cd	34.99 gm	307.2 mM	6.772 mBq	193.5 μBq	2β	600.0 Py	536.0 keV	$\leq$ 1 pW	$\leq$ 1 pW		
^{115}Cd	41.36 mg	359.9 μM	780.0 TBq	1.886×10^{7}	β	2.227 d	535.6 keV	66.93 W	1.618 kW	1.092 MSv	26.40 MSv
^{115m}Cd	79.21 mg	689.4 μM	74.67 TBq	942.7 TBq	β	44.60 d	629.0 keV	7.525 W	95.00 W	246.4 kSv	3.111 MSv
^{116}Cd	12.55 gm	108.3 mM	42.12 μBq	3.357 μBq	2β	$\geq 10^{18}$ y	2.804 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{117}Cd	1.096 mg	9.375 μM	418.1 TBq	3.815×10^{8}	β	2.490 h	1.215 MeV	81.36 W	74.23 kW	117.1 kSv	106.8 MSv
^{117m}Cd	777.7 μg	6.652 μM	226.8 TBq	2.916×10^{8}	β	3.360 h	1.371 MeV	49.81 W	64.05 kW	63.50 kSv	81.66 MSv
^{118}Cd	540.3 μg	4.582 μM	633.8 TBq	1.173×10^{9}	β	50.30 m	438.9 keV	44.56 W	82.47 kW		
^{119}Cd	50.86 μg	427.7 nM	316.4 TBq	6.221×10^{9}	β	2.690 m	1.850 MeV	93.78 W	1.844 MW		
^{119m}Cd	17.31 μg	145.6 nM	316.4 TBq	1.828×10^{10}	β	2.200 m	2.064 MeV	104.6 W	6.043 MW		
^{120}Cd	9.066 μg	75.61 nM	621.2 TBq	6.852×10^{10}	β	50.80 s	947.9 keV	94.33 W	10.40 MW		
^{121}Cd	2.272 μg	18.79 nM	612.7 TBq	2.697×10^{11}	β	13.50 s	2.794 MeV	274.3 W	120.7 MW		
^{122}Cd	936.6 ng	7.683 nM	582.8 TBq	6.223×10^{11}	β	5.240 s	1.449 MeV	135.3 W	144.5 MW		
^{123}Cd	1.368 μg	11.13 nM	552.4 TBq	4.038×10^{11}	β	2.100 s	3.368 MeV	298.1 W	217.9 MW		
^{124}Cd	2.562 μg	20.68 nM	502.5 TBq	1.961×10^{11}	β	1.250 s	2.287 MeV	184.1 W	71.86 MW		
^{125}Cd	178.7 ng	1.431 nM	368.1 TBq	2.060×10^{12}	β	650.0 ms	4.039 MeV	238.2 W	1.333 GW		
^{126}Cd	309.0 ng	2.454 nM	272.0 TBq	8.803×10^{11}	β	515.0 ms	2.960 MeV	129.0 W	417.5 MW		
^{127}Cd	32.13 ng	253.1 pM	160.3 TBq	4.989×10^{12}	β	370.0 ms	4.661 MeV	119.7 W	3.725 GW		
^{128}Cd	24.13 ng	188.6 pM	61.01 TBq	2.528×10^{12}	β	280.0 ms	3.696 MeV	36.13 W	1.497 GW		
^{129}Cd	2.584 ng	20.04 pM	24.77 TBq	9.586×10^{12}	β	242.0 ms	5.428 MeV	21.54 W	8.336 GW		
^{130}Cd	3.283 ng	25.27 pM	20.12 TBq	6.129×10^{12}	β	162.0 ms	4.579 MeV	14.76 W	4.496 GW		
^{131}Cd	121.4 pg	$\leq$ 1 pM	3.245 TBq	2.673×10^{13}	β	68.00 ms	7.402 MeV	3.848 W	31.70 GW		
^{132}Cd	13.40 pg	$\leq$ 1 pM	292.8 GBq	2.185×10^{13}	β	97.00 ms	6.690 MeV	313.8 mW	23.42 GW		
A $_{48}$Cd	196.1 gm	1.759 M	6.553×10^{6}	33.42 TBq				1.998 kW	10.19 W	1.601 MSv	8.164 kSv
^{79}Br	186.6 μg	2.364 μM									
^{79m}Br	$\leq$ 1 pg	$\leq$ 1 pM	769.6 MBq	1.088×10^{12}	γ	4.864 s	210.0 keV	25.89 μW	36.59 MW		
^{80}Br	7.231 ng	90.48 pM	36.16 GBq	5.001×10^{9}	β	17.60 m	801.5 keV	4.643 mW	642.1 kW	1.121 Sv	155.0 MSv
^{80m}Br	70.53 ng	882.5 pM	23.14 GBq	3.281×10^{8}	γ	4.410 h	84.54 keV	313.4 μW	4.443 kW	2.545 Sv	36.09 MSv
^{81}Br	31.96 gm	395.0 mM									
^{82}Br	7.124 mg	86.97 μM	285.5 TBq	4.008×10^{7}	β	1.472 d	2.779 MeV	127.1 W	17.84 kW	154.2 kSv	21.64 MSv
^{82m}Br	7.973 μg	97.33 nM	110.4 TBq	1.385×10^{10}	γ	6.090 m	78.14 keV	1.382 W	173.3 kW		
^{83}Br	6.750 mg	81.41 μM	3.948×10^{6}	5.849×10^{8}	β	2.400 h	328.5 keV	207.8 W	30.79 kW	169.8 kSv	25.15 MSv
^{84}Br	2.540 mg	30.27 μM	6.616×10^{6}	2.605×10^{9}	β	31.80 m	3.037 MeV	3.219 kW	1.267 MW	582.2 kSv	229.2 MSv
^{84m}Br	20.30 μg	241.9 nM	280.3 TBq	1.381×10^{10}	β	6.000 m	3.665 MeV	164.6 W	8.108 MW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{85}Br	275.0 μg	3.239 μM	7.855×10^{6}	2.856×10^{10}	β	2.900 m	1.041 MeV	1.310 kW	4.764 MW		
^{86}Br	62.41 μg	726.4 nM	5.509×10^{6}	8.827×10^{10}	β	55.00 s	5.094 MeV	4.496 kW	72.04 MW		
^{86m}Br	5.123 μg	60.14 nM	5.528×10^{6}	1.079×10^{12}	γ	4.500 s	4.753 MeV	4.209 kW	821.6 MW		
^{87}Br	145.9 μg	1.679 μM	1.255×10^{7}	8.602×10^{10}	β	55.70 s	3.861 MeV	7.763 kW	53.21 MW		
^{88}Br	44.19 μg	502.6 nM	1.286×10^{7}	2.910×10^{11}	β	16.50 s	2.530 MeV	5.213 kW	118.0 MW		
^{89}Br	8.233 μg	92.58 nM	8.584×10^{6}	1.043×10^{12}	β	4.370 s	4.797 MeV	6.597 kW	801.3 MW		
^{90}Br	1.824 μg	20.28 nM	5.287×10^{6}	2.899×10^{12}	β	1.900 s	5.676 MeV	4.808 kW	2.636 GW		
^{91}Br	247.5 ng	2.722 nM	1.893×10^{6}	7.648×10^{12}	β	538.0 ms	5.391 MeV	1.635 kW	6.606 GW		
^{92}Br	16.36 ng	177.9 pM	247.6 TBq	1.513×10^{13}	β	343.0 ms	6.688 MeV	265.3 W	16.22 GW		
^{93}Br	1.880 ng	20.23 pM	41.96 TBq	2.232×10^{13}	β	102.0 ms	6.563 MeV	44.12 W	23.47 GW		
^{94}Br	89.67 pg	$\leq$ 1 pM	3.605 TBq	4.020×10^{13}	β	70.00 ms	8.457 MeV	4.884 W	54.47 GW		
^{95}Br	8.304 pg	$\leq$ 1 pM	313.1 GBq	3.770×10^{13}	β	50.00 ms	7.496 MeV	376.0 mW	45.28 GW		
^{96}Br	$\leq$ 1 pg	$\leq$ 1 pM	16.44 GBq	5.191×10^{13}	β	20.00 ms	9.371 MeV	24.68 mW	77.93 GW		
E $_{35}$Br	31.98 gm	395.2 mM	7.160×10^{7}	2.239×10^{6}				40.07 kW	1.253 kW	906.1 kSv	28.34 kSv
^{113}In	27.58 mg	244.3 μM									
^{113m}In	$\leq$ 1 pg	$\leq$ 1 pM	190.0 kBq	6.191×10^{8}	γ	1.658 h	392.9 keV	11.96 nW	38.97 kW	5.320 μSv	17.33 MSv
^{114}In	11.72 ng	102.9 pM	597.2 GBq	5.096×10^{10}	β	1.198 m	803.5 keV	76.87 mW	6.559 MW		
^{114m}In	265.8 μg	2.334 μM	227.6 GBq	856.3 TBq	γ	50.00 d	239.4 keV	8.729 mW	32.84 W	933.2 Sv	3.511 MSv
^{115}In	2.575 gm	22.41 mM	593.1 mBq	230.3 mBq	β	441.0 Ty	242.0 keV	$\leq$ 1 pW	$\leq$ 1 pW	18.98 nSv	7.371 nSv
^{115m}In	3.332 mg	29.00 μM	781.4 TBq	2.345×10^{8}	γ	4.486 h	336.5 keV	42.12 W	12.64 kW	67.20 kSv	20.17 MSv
^{116}In	1.843 μg	15.90 nM	470.6 TBq	2.553×10^{11}	β	14.20 s	1.382 MeV	104.2 W	56.54 MW		
^{116m}In	309.4 μg	2.669 μM	342.8 TBq	1.108×10^{9}	β	54.60 m	2.777 MeV	152.5 W	492.9 kW	21.94 kSv	70.91 MSv
^{117}In	285.4 μg	2.441 μM	385.9 TBq	1.352×10^{9}	β	43.20 m	759.9 keV	46.98 W	164.6 kW	11.96 kSv	41.92 MSv
^{117m}In	955.9 μg	8.177 μM	488.4 TBq	5.109×10^{8}	β	1.937 h	637.2 keV	49.86 W	52.16 kW	58.61 kSv	61.31 MSv
^{118}In	895.6 ng	7.596 nM	633.8 TBq	7.077×10^{11}	β	5.000 s	2.038 MeV	206.9 W	231.0 MW		
^{118m}In	21.20 ng	179.8 pM	281.0 GBq	1.325×10^{10}	β	4.450 m	3.303 MeV	148.7 mW	7.014 MW		
^{119}In	7.787 μg	65.49 nM	182.2 TBq	2.340×10^{10}	β	2.400 m	1.349 MeV	39.37 W	5.056 MW		
^{119m}In	146.1 μg	1.229 μM	474.7 TBq	3.249×10^{9}	β	18.00 m	1.425 MeV	108.4 W	742.0 kW	22.31 kSv	152.7 MSv
^{120}In	4.048 μg	33.76 nM	317.2 TBq	7.836×10^{10}	β	3.080 s	3.906 MeV	198.5 W	49.04 MW		
^{120m}In	280.8 ng	2.342 nM	317.2 TBq	1.130×10^{12}	β	46.20 s	2.704 MeV	137.4 W	489.3 MW		
^{121}In	4.235 μg	35.03 nM	522.1 TBq	1.233×10^{11}	β	23.10 s	2.031 MeV	169.9 W	40.12 MW		
^{121m}In	7.465 μg	61.74 nM	130.1 TBq	1.743×10^{10}	β	3.880 m	2.173 MeV	45.30 W	6.068 MW		
^{122}In	1.837 μg	15.07 nM	629.0 TBq	3.424×10^{11}	β	1.500 s	4.648 MeV	468.4 W	255.0 MW		
^{122m}In	20.23 ng	165.9 pM	46.14 TBq	2.281×10^{12}	β	10.80 s	331.0 keV	2.447 W	121.0 MW		
^{123}In	910.2 ng	7.405 nM	517.6 TBq	5.687×10^{11}	β	5.980 s	2.341 MeV	194.1 W	213.2 MW		
^{123m}In	3.097 μg	25.20 nM	219.1 TBq	7.075×10^{10}	β	47.80 s	2.719 MeV	95.43 W	30.81 MW		
^{124}In	788.6 ng	6.364 nM	829.9 TBq	1.052×10^{12}	β	3.110 s	4.455 MeV	592.3 W	751.1 MW		
^{125}In	378.7 ng	3.032 nM	543.2 TBq	1.434×10^{12}	β	2.360 s	3.230 MeV	281.1 W	742.3 MW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{125m}In	1.430 μg	11.45 nM	398.1 TBq	2.784×10^{11}	β	12.20 s	3.351 MeV	213.7 W	149.4 MW		
^{126}In	549.9 ng	4.367 nM	1.191×10^{6}	2.166×10^{12}	β	1.530 s	5.133 MeV	979.4 W	1.781 GW		
^{127}In	438.4 ng	3.454 nM	720.8 TBq	1.644×10^{12}	β	1.090 s	4.066 MeV	469.5 W	1.071 GW		
^{127m}In	798.3 ng	6.290 nM	721.1 TBq	9.033×10^{11}	β	3.670 s	4.248 MeV	490.8 W	614.8 MW		
^{128}In	1.303 μg	10.19 nM	1.149×10^{6}	8.818×10^{11}	β	840.0 ms	5.873 MeV	1.081 kW	829.6 MW		
^{129}In	241.9 ng	1.876 nM	979.0 TBq	4.047×10^{12}	β	610.0 ms	4.619 MeV	724.4 W	2.995 GW		
^{130}In	162.1 ng	1.248 nM	982.4 TBq	6.060×10^{12}	β	290.0 ms	5.373 MeV	845.6 W	5.217 GW		
^{131}In	33.57 ng	256.4 pM	356.8 TBq	1.063×10^{13}	β	280.0 ms	5.418 MeV	309.7 W	9.225 GW		
^{132}In	3.318 ng	25.15 pM	87.47 TBq	2.636×10^{13}	β	201.0 ms	8.485 MeV	118.9 W	35.83 GW		
^{133}In	370.4 pg	2.786 pM	10.21 TBq	2.756×10^{13}	β	165.0 ms	7.801 MeV	12.76 W	34.45 GW		
^{134}In	14.78 pg	$\leq$ 1 pM	594.2 GBq	4.020×10^{13}	β	140.0 ms	9.147 MeV	870.7 mW	58.91 GW		
E $_{49}$In	2.608 gm	22.70 mM	1.443×10^{7}	5.533×10^{6}				8.182 kW	3.137 kW	183.0 kSv	70.15 kSv
^{152}Gd	73.66 mg	484.9 μM	59.38 mBq	806.1 mBq	α	108.0 Ty	2.198 MeV	$\leq$ 1 pW	$\leq$ 1 pW	2.435 nSv	33.05 nSv
^{153}Gd	6.755 mg	44.17 μM	881.7 GBq	130.5 TBq	ϵ	240.4 d	152.4 keV	21.53 mW	3.187 W	238.1 Sv	35.24 kSv
^{154}Gd	6.044 gm	39.27 mM									
^{155}Gd	216.6 mg	1.398 mM									
^{155m}Gd	$\leq$ 1 pg	$\leq$ 1 pM	50.58 GBq	8.694×10^{13}	γ	32.00 ms	121.5 keV	984.2 μW	1.692 GW		
^{156}Gd	120.5 gm	772.8 mM									
^{157}Gd	171.7 mg	1.094 mM									
^{158}Gd	33.19 gm	210.2 mM									
^{159}Gd	8.244 mg	51.87 μM	323.3 TBq	3.922×10^{7}	β	18.48 h	550.1 keV	28.49 W	3.456 kW	158.4 kSv	19.22 MSv
^{160}Gd	2.102 gm	13.14 mM	1.337 mBq	636.2 μBq	2β	130.0 Py	1.729 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{161}Gd	4.502 μg	27.98 nM	52.58 TBq	1.168×10^{10}	β	3.660 m	1.224 MeV	10.31 W	2.290 MW		
^{162}Gd	5.418 μg	33.46 nM	23.28 TBq	4.297×10^{9}	β	8.400 m	612.9 keV	2.286 W	421.9 kW		
^{163}Gd	333.7 ng	2.048 nM	9.217 TBq	2.762×10^{10}	β	1.133 m	1.667 MeV	2.461 W	7.375 MW		
^{164}Gd	1.828 μg	11.15 nM	3.578 TBq	1.957×10^{9}	β	45.00 s	1.075 MeV	616.3 mW	337.1 kW		
^{165}Gd	46.64 ng	282.8 pM	1.178 TBq	2.526×10^{10}	β	10.30 s	2.327 MeV	439.2 mW	9.417 MW		
E $_{64}$Gd	162.3 gm	1.038 M	414.1 TBq	2.551 TBq				44.63 W	274.9 mW	158.7 kSv	977.5 Sv
^{159}Tb	4.329 gm	27.24 mM									
^{160}Tb	160.8 mg	1.005 mM	67.19 TBq	417.8 TBq	β	72.30 d	1.374 MeV	14.79 W	91.98 W	107.5 kSv	668.6 kSv
^{161}Tb	15.20 mg	94.45 μM	65.93 TBq	4.338×10^{6}	β	6.890 d	338.0 keV	3.570 W	234.9 W	47.47 kSv	3.123 MSv
^{162}Tb	4.008 μg	24.75 nM	23.05 TBq	5.751×10^{9}	β	7.600 m	1.682 MeV	6.211 W	1.550 MW		
^{162m}Tb	2.189 μg	13.64 nM	702.6 GBq	3.210×10^{8}	γ	2.230 h	1.833 MeV	206.3 mW	94.24 kW		
^{163}Tb	4.545 μg	27.90 nM	9.953 TBq	2.190×10^{9}	β	19.50 m	1.018 MeV	1.623 W	357.1 kW		
^{164}Tb	314.3 ng	1.917 nM	4.447 TBq	1.415×10^{10}	β	3.000 m	2.362 MeV	1.683 W	5.355 MW		
^{165}Tb	25.00 ng	151.6 pM	1.932 TBq	7.728×10^{10}	β	2.110 m	1.703 MeV	527.0 mW	21.08 MW		
E $_{65}$Tb	4.505 gm	28.34 mM	173.2 TBq	38.45 TBq				28.61 W	6.351 W	155.0 kSv	34.40 kSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{76}Se	12.19 mg	160.6 μM									
^{77}Se	1.512 gm	19.66 mM									
^{77m}Se	905.7 pg	11.77 pM	280.7 GBq	3.099×10^{11}	γ	17.55 s	249.9 keV	11.24 mW	12.41 MW		
^{78}Se	3.686 gm	47.31 mM									
^{79}Se	8.870 gm	112.4 mM	22.87 GBq	2.578 GBq	β	377.0 ky	42.00 keV	153.9 μW	17.35 μW	66.32 Sv	7.477 Sv
^{79m}Se	22.35 μg	283.2 nM	506.2 TBq	2.265×10^{10}	γ	3.900 m	94.99 keV	7.703 W	344.7 kW		
^{80}Se	20.17 gm	252.4 mM									
^{81}Se	387.3 μg	4.786 μM	1.799×10^{6}	4.645×10^{9}	β	18.39 m	612.7 keV	176.6 W	456.0 kW	48.57 kSv	125.4 MSv
^{81m}Se	31.53 μg	389.7 nM	47.29 TBq	1.500×10^{9}	γ	57.28 m	103.0 keV	780.1 mW	24.74 kW	2.506 kSv	79.49 MSv
^{82}Se	50.43 gm	615.6 mM	67.30 μBq	1.334 μBq	2β	$\geq 10^{18}$ y	2.995 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{83}Se	421.4 μg	5.082 μM	1.571×10^{6}	3.728×10^{9}	β	22.30 m	3.000 MeV	755.1 W	1.792 MW	73.84 kSv	175.2 MSv
^{83m}Se	31.67 μg	381.9 nM	2.277×10^{6}	7.190×10^{10}	β	1.168 m	2.211 MeV	806.4 W	25.46 MW		
^{84}Se	252.7 μg	3.011 μM	6.346×10^{6}	2.511×10^{10}	β	3.100 m	938.9 keV	954.5 W	3.777 MW		
^{85}Se	28.24 μg	332.5 nM	3.558×10^{6}	1.260×10^{11}	β	31.70 s	3.354 MeV	1.912 kW	67.71 MW		
^{85m}Se	10.27 μg	122.0 nM	2.657×10^{6}	2.587×10^{11}	γ	19.00 s	3.493 MeV	1.487 kW	144.8 MW		
^{86}Se	23.18 μg	269.8 nM	6.782×10^{6}	2.926×10^{11}	β	15.30 s	2.438 MeV	2.649 kW	114.3 MW		
^{87}Se	6.543 μg	75.27 nM	5.609×10^{6}	8.573×10^{11}	β	5.500 s	4.238 MeV	3.808 kW	582.0 MW		
^{88}Se	667.5 ng	7.591 nM	2.112×10^{6}	3.164×10^{12}	β	1.530 s	3.727 MeV	1.261 kW	1.889 GW		
^{89}Se	53.89 ng	605.9 pM	616.8 TBq	1.145×10^{13}	β	410.0 ms	5.094 MeV	503.4 W	9.341 GW		
^{90}Se	21.44 ng	238.4 pM	179.5 TBq	8.372×10^{12}	β	300.0 ms	4.587 MeV	131.9 W	6.152 GW		
^{91}Se	1.138 ng	12.51 pM	28.30 TBq	2.487×10^{13}	β	270.0 ms	6.546 MeV	29.68 W	26.08 GW		
^{92}Se	92.68 pg	1.008 pM	1.698 TBq	1.832×10^{13}	β	100.0 ms	5.569 MeV	1.515 W	16.35 GW		
E $_{34}$Se	84.68 gm	1.048 M	3.409×10^{7}	402.6 TBq				14.48 kW	171.0 W	125.0 kSv	1.476 kSv
^{75}As	298.2 mg	3.980 mM									
^{76}As	33.58 μg	442.3 nM	1.948 TBq	5.801×10^{7}	β	1.092 d	1.494 MeV	466.1 mW	13.88 kW	3.117 kSv	92.82 MSv
^{77}As	2.359 mg	30.67 μM	91.58 TBq	3.882×10^{7}	β	1.618 d	237.6 keV	3.486 W	1.478 kW	36.63 kSv	15.53 MSv
^{78}As	218.6 μg	2.805 μM	215.0 TBq	9.835×10^{8}	β	1.512 h	2.637 MeV	90.84 W	415.6 kW	45.15 kSv	206.5 MSv
^{79}As	51.50 μg	652.6 nM	503.9 TBq	9.784×10^{9}	β	9.010 m	879.4 keV	70.99 W	1.378 MW		
^{80}As	3.398 μg	42.52 nM	1.075×10^{6}	3.164×10^{11}	β	15.20 s	3.129 MeV	538.8 W	158.6 MW		
^{81}As	10.32 μg	127.5 nM	1.662×10^{6}	1.610×10^{11}	β	33.30 s	1.669 MeV	444.4 W	43.06 MW		
^{82}As	5.673 μg	69.25 nM	1.376×10^{6}	2.426×10^{11}	β	19.10 s	3.488 MeV	769.0 W	135.6 MW		
^{82m}As	1.502 μg	18.33 nM	588.3 TBq	3.917×10^{11}	β	13.60 s	5.704 MeV	537.6 W	357.9 MW		
^{83}As	6.378 μg	76.91 nM	2.377×10^{6}	3.727×10^{11}	β	13.40 s	2.660 MeV	1.013 kW	158.8 MW		
^{84}As	2.279 μg	27.15 nM	1.954×10^{6}	8.574×10^{11}	β	4.020 s	5.865 MeV	1.836 kW	805.6 MW		
^{85}As	454.1 ng	5.347 nM	1.099×10^{6}	2.420×10^{12}	β	2.040 s	5.037 MeV	886.9 W	1.953 GW		
^{86}As	106.5 ng	1.239 nM	574.6 TBq	5.395×10^{12}	β	945.0 ms	6.807 MeV	626.6 W	5.884 GW		
^{87}As	16.80 ng	193.2 pM	268.8 TBq	1.600×10^{13}	β	610.0 ms	5.898 MeV	254.0 W	15.12 GW		
^{88}As	690.7 pg	7.854 pM	25.23 TBq	3.653×10^{13}	β	300.0 ms	7.907 MeV	31.96 W	46.27 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{89}As	75.30 pg	$\leq$ 1 pM	2.730 TBq	3.625×10^{13}	β	200.0 ms	7.335 MeV	3.208 W	42.60 GW		
E $_{33}$As	300.9 mg	4.015 mM	1.182×10^{7}	3.927×10^{7}				7.107 kW	23.62 kW	84.90 kSv	282.2 kSv
^{70}Ge	33.14 ng	473.9 pM									
^{72}Ge	32.94 mg	458.0 μM									
^{73}Ge	66.58 mg	913.0 μM									
^{73m}Ge	480.4 pg	6.588 pM	5.184 TBq	1.079×10^{13}	γ	500.0 ms	67.02 keV	55.66 mW	115.9 MW		
^{74}Ge	147.3 mg	1.993 mM									
^{75}Ge	17.92 μg	239.2 nM	20.09 TBq	1.121×10^{9}	β	1.380 h	466.1 keV	1.500 W	83.71 kW	924.1 Sv	51.57 MSv
^{75m}Ge	8.122 ng	108.4 pM	925.0 GBq	1.139×10^{11}	γ	47.70 s	139.0 keV	20.60 mW	2.536 MW		
^{76}Ge	748.2 mg	9.855 mM	82.50 nBq	110.3 nBq	2β	$\geq 10^{18}$ y	2.039 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{77}Ge	253.0 μg	3.289 μM	33.73 TBq	1.333×10^{8}	β	11.30 h	1.733 MeV	9.363 W	37.01 kW	11.13 kSv	44.00 MSv
^{77m}Ge	728.3 ng	9.468 nM	72.74 TBq	9.988×10^{10}	β	52.90 s	1.034 MeV	12.05 W	16.55 MW		
^{78}Ge	203.1 μg	2.606 μM	208.3 TBq	1.026×10^{9}	β	1.467 h	515.1 keV	17.19 W	84.64 kW	25.00 kSv	123.1 MSv
^{79}Ge	3.514 μg	44.52 nM	431.8 TBq	1.229×10^{11}	β	18.98 s	2.145 MeV	148.4 W	42.23 MW		
^{80}Ge	3.708 μg	46.39 nM	806.6 TBq	2.175×10^{11}	β	29.50 s	1.028 MeV	132.9 W	35.84 MW		
^{81}Ge	1.827 μg	22.58 nM	932.4 TBq	5.103×10^{11}	β	8.000 s	3.247 MeV	485.0 W	265.5 MW		
^{82}Ge	710.4 ng	8.671 nM	786.3 TBq	1.107×10^{12}	β	4.550 s	2.064 MeV	260.0 W	366.0 MW		
^{83}Ge	210.7 ng	2.541 nM	558.0 TBq	2.648×10^{12}	β	1.850 s	5.041 MeV	450.6 W	2.139 GW		
^{84}Ge	46.66 ng	555.9 pM	193.3 TBq	4.143×10^{12}	β	954.0 ms	4.337 MeV	134.3 W	2.878 GW		
^{85}Ge	2.172 ng	25.57 pM	45.55 TBq	2.097×10^{13}	β	540.0 ms	6.071 MeV	44.30 W	20.40 GW		
^{86}Ge	461.5 pg	5.370 pM	8.654 TBq	1.875×10^{13}	β	300.0 ms	5.557 MeV	7.705 W	16.70 GW		
^{87}Ge	30.30 pg	$\leq$ 1 pM	1.159 TBq	3.825×10^{13}	β	150.0 ms	7.125 MeV	1.323 W	43.66 GW		
^{88}Ge	1.538 pg	$\leq$ 1 pM	51.13 GBq	3.324×10^{13}	β	80.00 ms	6.500 MeV	53.24 mW	34.62 GW		
E $_{32}$Ge	995.5 mg	13.22 mM	4.105×10^{6}	4.123×10^{6}				1.705 kW	1.712 kW	37.05 kSv	37.22 kSv
^{165}Ho	285.6 mg	1.732 mM									
^{166}Ho	336.2 μg	2.026 μM	8.765 TBq	2.607×10^{7}	β	1.117 d	722.8 keV	1.015 W	3.019 kW	12.27 kSv	36.50 MSv
^{166m}Ho	3.525 mg	21.24 μM	234.2 MBq	66.44 GBq	β	1.200 ky	1.869 MeV	70.11 μW	19.89 mW	468.4 mSv	132.9 Sv
E $_{67}$Ho	289.5 mg	1.755 mM	8.765 TBq	30.28 TBq				1.015 W	3.507 W	12.27 kSv	42.39 kSv
^{160}Dy	452.0 mg	2.826 mM									
^{161}Dy	697.2 mg	4.332 mM									
^{162}Dy	572.7 mg	3.537 mM									
^{163}Dy	537.5 mg	3.299 mM									
^{164}Dy	133.0 mg	811.3 μM									
^{165}Dy	107.2 μg	650.0 nM	32.06 TBq	2.991×10^{8}	β	2.334 h	781.1 keV	4.012 W	37.43 kW	3.527 kSv	32.90 MSv
^{165m}Dy	595.9 ng	3.613 nM	20.01 TBq	3.358×10^{10}	γ	1.257 m	126.0 keV	404.0 mW	678.0 kW		
^{166}Dy	163.3 μg	984.1 nM	1.400 TBq	8.573×10^{6}	β	3.401 d	197.0 keV	44.19 mW	270.6 W	2.240 kSv	13.72 MSv
E $_{66}$Dy	2.393 gm	14.81 mM	53.47 TBq	22.35 TBq				4.460 W	1.864 W	5.767 kSv	2.410 kSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{69}Ga	5.670 μg	82.26 nM									
^{70}Ga	1.789 pg	$\leq$ 1 pM	8.429 MBq	4.712×10^{9}	β	21.14 m	653.1 keV	881.9 nW	493.0 kW	261.3 μSv	146.1 MSv
^{71}Ga	2.257 μg	31.82 nM									
^{72}Ga	23.66 μg	328.9 nM	2.704 TBq	1.143×10^{8}	β	14.10 h	3.206 MeV	1.389 W	58.71 kW	2.974 kSv	125.7 MSv
^{73}Ga	15.91 μg	218.2 nM	5.180 TBq	3.256×10^{8}	β	4.860 h	763.1 keV	633.3 mW	39.81 kW	1.347 kSv	84.65 MSv
^{74}Ga	835.6 ng	11.30 nM	9.701 TBq	1.161×10^{10}	β	8.120 m	4.342 MeV	6.748 W	8.076 MW		
^{75}Ga	405.5 ng	5.412 nM	19.81 TBq	4.885×10^{10}	β	2.100 m	1.381 MeV	4.382 W	10.81 MW		
^{76}Ga	202.6 ng	2.668 nM	41.07 TBq	2.027×10^{11}	β	32.60 s	4.870 MeV	32.04 W	158.1 MW		
^{77}Ga	173.3 ng	2.253 nM	72.30 TBq	4.172×10^{11}	β	13.00 s	2.559 MeV	29.64 W	171.0 MW		
^{78}Ga	112.4 ng	1.442 nM	122.8 TBq	1.093×10^{12}	β	5.090 s	4.585 MeV	90.21 W	802.6 MW		
^{79}Ga	76.97 ng	975.1 pM	142.3 TBq	1.849×10^{12}	β	2.847 s	3.501 MeV	79.81 W	1.037 GW		
^{80}Ga	43.66 ng	546.2 pM	134.1 TBq	3.071×10^{12}	β	1.697 s	5.623 MeV	120.8 W	2.767 GW		
^{81}Ga	10.81 ng	133.6 pM	79.03 TBq	7.311×10^{12}	β	1.217 s	4.481 MeV	56.74 W	5.249 GW		
^{82}Ga	900.6 pg	10.99 pM	29.82 TBq	3.311×10^{13}	β	599.0 ms	7.590 MeV	36.26 W	40.26 GW		
^{83}Ga	244.1 pg	2.943 pM	8.314 TBq	3.406×10^{13}	β	308.0 ms	7.138 MeV	9.508 W	38.95 GW		
^{84}Ga	22.70 pg	$\leq$ 1 pM	1.142 TBq	5.031×10^{13}	β	85.00 ms	8.543 MeV	1.563 W	68.85 GW		
E $_{31}$Ga	49.36 μg	685.9 nM	668.3 TBq	1.354×10^{10}				469.7 W	9.516 MW	4.321 kSv	87.55 MSv
^{66}Zn	53.48 ng	811.2 pM									
^{67}Zn	2.226 ng	33.26 pM									
^{68}Zn	2.128 mg	31.33 μM									
^{69}Zn	549.2 pg	7.968 pM	972.0 MBq	1.770×10^{9}	β	56.40 m	320.8 keV	49.96 μW	90.97 kW	30.13 mSv	54.87 MSv
^{69m}Zn	534.6 pg	7.756 pM	65.31 MBq	1.222×10^{8}	γ	13.78 h	438.8 keV	4.591 μW	8.588 kW	21.55 mSv	40.31 MSv
^{70}Zn	7.588 mg	108.5 μM									
^{71}Zn	3.388 pg	$\leq$ 1 pM	138.4 MBq	4.085×10^{10}	β	2.450 m	2.806 MeV	62.22 μW	18.36 MW		
^{71m}Zn	34.81 pg	$\leq$ 1 pM	14.51 MBq	4.168×10^{8}	β	3.960 h	2.963 MeV	6.888 μW	197.9 kW	3.482 mSv	100.0 MSv
^{72}Zn	77.77 μg	1.081 μM	2.694 TBq	3.464×10^{7}	β	1.938 d	255.3 keV	110.2 mW	1.417 kW	3.772 kSv	48.50 MSv
^{73}Zn	20.16 ng	276.4 pM	4.906 TBq	2.434×10^{11}	β	23.50 s	2.456 MeV	1.930 W	95.73 MW		
^{74}Zn	152.0 ng	2.056 nM	9.032 TBq	5.942×10^{10}	β	1.593 m	1.084 MeV	1.568 W	10.32 MW		
^{75}Zn	26.33 ng	351.4 pM	16.29 TBq	6.187×10^{11}	β	10.20 s	3.278 MeV	8.556 W	325.0 MW		
^{76}Zn	26.14 ng	344.2 pM	26.60 TBq	1.018×10^{12}	β	5.700 s	2.199 MeV	9.370 W	358.5 MW		
^{77}Zn	7.447 ng	96.79 pM	28.85 TBq	3.874×10^{12}	β	2.080 s	4.228 MeV	19.54 W	2.624 GW		
^{78}Zn	12.45 ng	159.7 pM	27.45 TBq	2.205×10^{12}	β	1.470 s	3.095 MeV	13.61 W	1.093 GW		
^{79}Zn	1.367 ng	17.32 pM	18.91 TBq	1.383×10^{13}	β	995.0 ms	5.262 MeV	15.94 W	11.66 GW		
^{80}Zn	901.3 pg	11.27 pM	6.616 TBq	7.341×10^{12}	β	545.0 ms	4.064 MeV	4.307 W	4.779 GW		
^{81}Zn	38.90 pg	$\leq$ 1 pM	1.550 TBq	3.985×10^{13}	β	290.0 ms	7.265 MeV	1.804 W	46.38 GW		
^{82}Zn	5.476 pg	$\leq$ 1 pM	206.1 GBq	3.764×10^{13}	β	100.0 ms	6.730 MeV	222.2 mW	40.58 GW		
^{83}Zn	$\leq$ 1 pg	$\leq$ 1 pM	19.39 GBq	5.999×10^{13}	β	80.00 ms	8.228 MeV	25.56 mW	79.08 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
E $_{30}$Zn	9.794 mg	140.9 μM	143.1 TBq	1.461×10^{7}				76.98 W	7.860 kW	3.772 kSv	385.1 kSv
G $^{3}_{1}$H	86.08 mg	28.54 mM	30.75 TBq	357.2 TBq	β	12.33 y	5.680 keV	27.98 mW	325.0 mW	1.292 kSv	15.00 kSv
^{166}Er	88.04 mg	530.6 μM									
^{167}Er	5.663 mg	33.92 μM									
^{167m}Er	203.6 pg	1.220 pM	221.4 GBq	1.087×10^{12}	γ	2.270 s	208.0 keV	7.376 mW	36.23 MW		
^{168}Er	11.31 mg	67.35 μM									
^{169}Er	4.681 μg	27.71 nM	14.24 GBq	3.042×10^{6}	β	9.400 d	340.0 keV	775.7 μW	165.7 W	5.269 Sv	1.126 MSv
^{170}Er	36.03 ng	212.0 pM									
^{171}Er	$\leq$ 1 pg	$\leq$ 1 pM	37.67 kBq	9.023×10^{7}	β	7.516 h	806.6 keV	4.868 nW	11.66 kW	13.56 μSv	32.48 MSv
^{172}Er	$\leq$ 1 pg	$\leq$ 1 pM	10.52 Bq	1.376×10^{7}	β	2.054 d	910.2 keV	1.534 pW	2.007 kW	10.52 nSv	13.76 MSv
E $_{68}$Er	105.0 mg	631.9 μM	235.6 GBq	2.244 TBq				8.152 mW	77.62 mW	5.269 Sv	50.17 Sv
^{169}Tm	90.62 μg	536.4 nM									
^{170}Tm	15.97 μg	93.98 nM	3.532 GBq	221.2 TBq	β	128.6 d	334.7 keV	189.4 μW	11.86 W	4.592 Sv	287.5 kSv
^{170m}Tm	$\leq$ 1 pg	$\leq$ 1 pM	376.4 MBq	6.043×10^{17}	γ	4.100 μs					
^{171}Tm	1.812 μg	10.60 nM	73.04 MBq	40.31 TBq	β	1.917 y	26.16 keV	306.1 nW	168.9 mW	8.034 mSv	4.434 kSv
^{172}Tm	669.6 pg	3.894 pM	7.100 MBq	1.060×10^{7}	β	2.650 d	1.881 MeV	2.139 μW	3.194 kW	12.07 mSv	18.03 MSv
E $_{69}$Tm	108.4 μg	641.0 nM	3.989 GBq	36.79 TBq				191.8 μW	1.770 W	4.612 Sv	42.54 kSv
E $^{14}_{6}$C	40.22 μg	2.872 μM	6.634 MBq	164.9 GBq	β	5.700 ky	49.48 keV	52.59 nW	1.308 mW	3.848 mSv	95.67 Sv
^{9}Be	29.79 μg	3.306 μM									
^{10}Be	198.9 μg	19.86 μM	164.5 kBq	827.0 MBq	β	1.600 My	202.6 keV	5.338 nW	26.84 μW	180.9 μSv	909.8 mSv
E $_{4}$Be	228.7 μg	23.17 μM	164.5 kBq	719.3 MBq				5.338 nW	23.34 μW	180.9 μSv	791.2 mSv
^{66}Cu	$\leq$ 1 pg	$\leq$ 1 pM	2.547 MBq	2.067×10^{10}	β	5.100 m	1.155 MeV	471.2 nW	3.825 MW		
^{67}Cu	$\leq$ 1 pg	$\leq$ 1 pM	3.874 Bq	2.797×10^{7}	β	2.579 d	271.0 keV	$\leq$ 1 pW	1.214 kW	1.317 nSv	9.510 MSv
^{72}Cu	2.355 ng	32.74 pM	2.276 TBq	9.665×10^{11}	β	6.600 s	4.690 MeV	1.710 W	726.1 MW		
^{73}Cu	2.028 ng	27.80 pM	2.938 TBq	1.449×10^{12}	β	4.200 s	3.459 MeV	1.628 W	802.8 MW		
^{74}Cu	385.0 pg	5.207 pM	3.793 TBq	9.852×10^{12}	β	1.594 s	5.603 MeV	3.405 W	8.844 GW		
^{75}Cu	509.6 pg	6.800 pM	3.700 TBq	7.261×10^{12}	β	1.224 s	4.508 MeV	2.672 W	5.243 GW		
^{76}Cu	109.1 pg	1.437 pM	2.712 TBq	2.486×10^{13}	β	641.0 ms	6.629 MeV	2.880 W	26.40 GW		
^{77}Cu	67.83 pg	$\leq$ 1 pM	1.249 TBq	1.841×10^{13}	β	469.0 ms	5.522 MeV	1.105 W	16.29 GW		
^{78}Cu	10.02 pg	$\leq$ 1 pM	445.1 GBq	4.442×10^{13}	β	342.0 ms	7.588 MeV	541.1 mW	54.00 GW		
^{79}Cu	3.805 pg	$\leq$ 1 pM	136.5 GBq	3.587×10^{13}	β	188.0 ms	6.535 MeV	142.9 mW	37.56 GW		
^{80}Cu	$\leq$ 1 pg	$\leq$ 1 pM	14.22 GBq	5.729×10^{13}	β	100.0 ms	9.539 MeV	21.73 mW	87.55 GW		
^{81}Cu	$\leq$ 1 pg	$\leq$ 1 pM	1.060 GBq	6.919×10^{13}	β	632.0 ns	9.116 MeV	1.548 mW	101.0 GW		
A $_{29}$Cu	5.469 ng	75.05 pM	17.26 TBq	3.157×10^{12}				14.11 W	2.580 GW	1.317 nSv	240.9 mSv
^{6}Li	241.9 μg	40.22 μM									
^{7}Li	15.49 μg	2.208 μM									

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
E $_{3}$Li	257.4 μg	42.42 μM									
^{72}Co	1.267 pg	$\leq$ 1 pM	59.87 GBq	4.725×10^{13}	β	90.00 ms	8.581 MeV	82.30 mW	64.96 GW		
^{73}Co	$\leq$ 1 pg	$\leq$ 1 pM	19.43 GBq	4.954×10^{13}	β	80.00 ms	7.623 MeV	23.73 mW	60.50 GW		
^{74}Co	$\leq$ 1 pg	$\leq$ 1 pM	3.711 GBq	5.248×10^{13}	β	50.00 ms	9.539 MeV	5.671 mW	80.20 GW		
^{75}Co	$\leq$ 1 pg	$\leq$ 1 pM	490.2 MBq	6.944×10^{13}	β	40.00 ms	8.571 MeV	673.1 μW	95.35 GW		
A $_{27}$Co	1.737 pg	$\leq$ 1 pM	83.50 GBq	4.807×10^{13}				112.4 mW	64.70 GW		
^{72}Ni	479.3 pg	6.662 pM	1.149 TBq	2.397×10^{12}	β	1.570 s	3.207 MeV	590.4 mW	1.232 GW		
^{73}Ni	65.79 pg	$\leq$ 1 pM	956.5 GBq	1.454×10^{13}	β	840.0 ms	5.375 MeV	823.6 mW	12.52 GW		
^{74}Ni	64.49 pg	$\leq$ 1 pM	561.3 GBq	8.704×10^{12}	β	680.0 ms	4.250 MeV	382.2 mW	5.927 GW		
^{75}Ni	7.299 pg	$\leq$ 1 pM	226.3 GBq	3.100×10^{13}	β	600.0 ms	6.419 MeV	232.7 mW	31.88 GW		
^{76}Ni	2.817 pg	$\leq$ 1 pM	57.68 GBq	2.048×10^{13}	β	470.0 ms	5.272 MeV	48.72 mW	17.29 GW		
^{77}Ni	$\leq$ 1 pg	$\leq$ 1 pM	9.864 GBq	5.278×10^{13}	β	300.0 ms	7.391 MeV	11.68 mW	62.49 GW		
^{78}Ni	$\leq$ 1 pg	$\leq$ 1 pM	1.148 GBq	3.892×10^{13}	β	200.0 ms	6.302 MeV	1.159 mW	39.29 GW		
A $_{28}$Ni	619.9 pg	8.574 pM	2.962 TBq	4.778×10^{12}				2.090 W	3.372 GW		
^{79}Kr	1.093 pg	$\leq$ 1 pM	45.95 kBq	4.204×10^{7}	ϵ	1.460 d	281.6 keV	2.073 nW	1.897 kW		
^{80}Kr	358.7 μg	4.488 μM									
^{81}Kr	42.36 μg	523.5 nM	32.97 kBq	778.3 MBq	ϵ	210.0 ky	20.81 keV	109.9 pW	2.594 μW		
^{81m}Kr	4.155 pg	$\leq$ 1 pM	1.611 GBq	3.877×10^{11}	γ	13.20 s	190.0 keV	49.03 μW	11.80 MW		
^{82}Kr	2.015 gm	24.60 mM									
^{83}Kr	57.84 gm	697.6 mM									
^{83m}Kr	5.191 mg	62.61 μM	3.963×10^{6}	7.634×10^{8}	γ	1.830 h	40.78 keV	25.89 W	4.987 kW		
^{84}Kr	172.8 gm	2.059 M									
^{85}Kr	34.40 gm	405.1 mM	499.5 TBq	14.52 TBq	β	10.75 y	252.7 keV	20.22 W	587.8 mW		
^{85m}Kr	26.17 mg	308.2 μM	7.970×10^{6}	3.045×10^{8}	β	4.480 h	413.1 keV	527.5 W	20.16 kW		
^{86}Kr	282.3 gm	3.286 M									
^{87}Kr	14.22 mg	163.6 μM	1.491×10^{7}	1.049×10^{9}	β	1.272 h	2.120 MeV	5.064 kW	356.1 kW		
^{88}Kr	44.99 mg	511.7 μM	2.089×10^{7}	4.643×10^{8}	β	2.840 h	2.319 MeV	7.761 kW	172.5 kW		
^{89}Kr	1.010 mg	11.36 μM	2.492×10^{7}	2.467×10^{10}	β	3.150 m	3.199 MeV	12.77 kW	12.64 MW		
^{90}Kr	171.3 μg	1.905 μM	2.459×10^{7}	1.435×10^{11}	β	32.32 s	2.592 MeV	10.21 kW	59.60 MW		
^{91}Kr	34.70 μg	381.6 nM	1.830×10^{7}	5.274×10^{11}	β	8.570 s	3.301 MeV	9.679 kW	278.9 MW		
^{92}Kr	3.819 μg	41.54 nM	9.420×10^{6}	2.467×10^{12}	β	1.840 s	3.189 MeV	4.813 kW	1.260 GW		
^{93}Kr	1.006 μg	10.83 nM	3.556×10^{6}	3.535×10^{12}	β	1.286 s	4.797 MeV	2.733 kW	2.717 GW		
^{94}Kr	55.13 ng	586.9 pM	1.166×10^{6}	2.115×10^{13}	β	210.0 ms	3.869 MeV	722.7 W	13.11 GW		
^{95}Kr	20.93 ng	220.5 pM	184.0 TBq	8.791×10^{12}	β	114.0 ms	5.889 MeV	173.6 W	8.294 GW		
^{96}Kr	2.827 ng	29.47 pM	27.92 TBq	9.876×10^{12}	β	80.00 ms	4.854 MeV	21.71 W	7.680 GW		
^{97}Kr	60.17 pg	$\leq$ 1 pM	1.744 TBq	2.898×10^{13}	β	63.00 ms	6.997 MeV	1.955 W	32.49 GW		
^{98}Kr	10.40 pg	$\leq$ 1 pM	197.6 GBq	1.900×10^{13}	β	46.00 ms	5.708 MeV	180.7 mW	17.38 GW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
G $_{36}$Kr	549.4 gm	6.474 M	1.304×10^{8}	237.3 TBq				54.52 kW	99.23 W		
^{127}Xe	3.941 μg	31.05 nM	4.118 GBq	1.045×10^{6}	ϵ	36.40 d	309.2 keV	204.0 μW	51.76 W		
^{128}Xe	7.057 gm	55.17 mM									
^{129}Xe	52.18 mg	404.8 μM									
^{129m}Xe	104.5 μg	810.7 nM	489.5 GBq	4.684×10^{6}	γ	8.880 d	235.9 keV	18.50 mW	177.0 W		
^{130}Xe	23.08 gm	177.7 mM									
^{131}Xe	557.8 gm	4.261 M									
^{131m}Xe	132.5 mg	1.012 mM	410.7 TBq	3.100×10^{6}	γ	11.93 d	162.3 keV	10.68 W	80.60 W		
^{132}Xe	1.748 kg	13.25 M									
^{133}Xe	10.50 gm	79.00 mM	7.278×10^{7}	6.931×10^{6}	β	5.244 d	180.6 keV	2.106 kW	200.6 W		
^{133m}Xe	138.8 mg	1.044 mM	2.304×10^{6}	1.660×10^{7}	γ	2.188 d	231.7 keV	85.53 W	616.2 W		
^{134}Xe	2.246 kg	16.77 M	20.17 Bq	8.980 mBq	2β	11.00 Py	830.0 keV	2.682 pW	$\leq$ 1 pW		
^{134m}Xe	56.12 ng	419.1 pM	603.1 TBq	1.075×10^{13}	γ	290.0 ms	1.904 MeV	184.0 W	3.279 GW		
^{135}Xe	203.1 mg	1.505 mM	1.920×10^{7}	9.453×10^{7}	β	9.140 h	564.7 keV	1.737 kW	8.552 kW		
^{135m}Xe	4.380 mg	32.47 μM	1.477×10^{7}	3.372×10^{9}	γ	15.29 m	526.6 keV	1.246 kW	284.5 kW		
^{136}Xe	3.429 kg	25.23 M	1.589 mBq	463.5 nBq	2β	$\geq 10^{18}$ y	2.467 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{137}Xe	4.768 mg	34.83 μM	6.323×10^{7}	1.326×10^{10}	β	3.818 m	1.964 MeV	19.89 kW	4.172 MW		
^{138}Xe	16.29 mg	118.1 μM	5.798×10^{7}	3.559×10^{9}	β	14.08 m	1.801 MeV	16.73 kW	1.027 MW		
^{139}Xe	589.1 μg	4.241 μM	4.481×10^{7}	7.607×10^{10}	β	39.68 s	2.672 MeV	19.18 kW	32.56 MW		
^{140}Xe	130.0 μg	929.1 nM	2.851×10^{7}	2.193×10^{11}	β	13.60 s	2.244 MeV	10.25 kW	78.85 MW		
^{141}Xe	5.857 μg	41.56 nM	1.009×10^{7}	1.723×10^{12}	β	1.730 s	3.839 MeV	6.206 kW	1.060 GW		
^{142}Xe	1.428 μg	10.06 nM	3.443×10^{6}	2.411×10^{12}	β	1.220 s	2.863 MeV	1.579 kW	1.106 GW		
^{143}Xe	61.45 ng	429.9 pM	598.3 TBq	9.736×10^{12}	β	511.0 ms	4.487 MeV	430.1 W	6.999 GW		
^{144}Xe	36.40 ng	252.9 pM	105.6 TBq	2.901×10^{12}	β	388.0 ms	3.203 MeV	54.18 W	1.488 GW		
^{145}Xe	3.752 ng	25.89 pM	12.01 TBq	3.201×10^{12}	β	188.0 ms	5.035 MeV	9.687 W	2.582 GW		
^{146}Xe	248.1 pg	1.700 pM	757.4 GBq	3.053×10^{12}	β	146.0 ms	3.953 MeV	479.6 mW	1.933 GW		
^{147}Xe	6.233 pg	$\leq$ 1 pM	67.12 GBq	1.077×10^{13}	β	130.0 ms	5.716 MeV	61.46 mW	9.860 GW		
G $_{54}$Xe	8.022 kg	59.83 M	3.188×10^{8}	39.75 TBq				79.70 kW	9.935 W		
^{170}Yb	23.49 μg	138.2 nM									
^{171}Yb	1.614 μg	9.442 nM									
^{172}Yb	143.2 ng	832.9 pM									
E $_{70}$Yb	25.25 μg	148.5 nM									
Total	52.18 kg	443.6 M	6.305×10^{9}	120.8 TBq				1.999 MW	38.31 W	3.642 GSv	69.79 kSv

ICRP Publication 119 does not report dose factors for isotopes with half lives less than ten minutes or greater than 10^9 years.
Dose factors for gases are given as Sv/day per Bq/m^3. Radiotoxicity is not computed for gases.

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Actinides and Daughters Per Tonne of Fuel

used for 50.68 GW-day LWR burnup at power of 36.5 MW and $3.14 \times 10^{14} N/\mathrm{cm}^2/s$ neutron flux,
at discharge, as calculated by ORIGEN2 version 2.1 on 9 October 2013.
Radiotoxicity in Sieverts computed for adult ingestion using dose factors from ICRP publication 119

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{236}Np	2.483 mg	10.52 μM	1.211 MBq	487.7 MBq	ϵ	152.0 ky	340.2 keV	66.00 nW	26.58 μW	20.59 mSv	8.291 Sv
^{237}Np	636.3 gm	2.684 M	16.60 GBq	26.09 MBq	α	2.140 My	5.155 MeV	13.71 mW	21.55 μW	1.826 kSv	2.870 Sv
^{238}Np	2.063 gm	8.666 mM	1.979×10^{7}	9.593×10^{6}	β	2.117 d	808.1 keV	2.562 kW	1.242 kW	18.01 MSv	8.729 MSv
^{239}Np	94.80 gm	396.6 mM	8.140×10^{8}	8.586×10^{6}	β	2.355 d	407.8 keV	53.18 kW	561.0 W	651.2 MSv	6.869 MSv
^{240}Np	2.817 mg	11.73 μM	1.257×10^{6}	4.462×10^{8}	β	1.083 h	1.788 MeV	360.0 W	127.8 kW	103.1 kSv	36.59 MSv
^{240m}Np	238.0 ng	991.4 pM	932.8 GBq	3.919×10^{9}	β	7.400 m	977.7 keV	146.1 mW	613.9 kW		
^{241}Np	$\leq$ 1 pg	$\leq$ 1 pM	1.744 MBq	1.805×10^{9}	β	13.90 m	471.0 keV	131.6 nW	136.2 kW		
C $_{93}$Np	733.2 gm	3.090 M	8.350×10^{8}	1.139×10^{6}				56.10 kW	76.52 W	669.3 MSv	912.9 kSv
^{236}Pu	1.109 ng	4.698 pM	21.81 kBq	19.67 TBq	α	2.858 y	5.870 MeV	20.51 nW	18.49 W	1.897 mSv	1.711 MSv
^{237}Pu	91.38 μg	385.5 nM	40.89 GBq	447.5 TBq	ϵ	45.30 d	62.16 keV	407.2 μW	4.456 W	4.089 Sv	44.75 kSv
^{238}Pu	297.9 gm	1.251 M	188.8 TBq	633.8 GBq	α	87.70 y	5.591 MeV	169.1 W	567.6 mW	43.42 MSv	145.8 kSv
^{239}Pu	6.089 kg	25.47 M	14.01 TBq	2.301 GBq	α	24.11 ky	5.199 MeV	11.67 W	1.917 mW	3.503 MSv	575.2 Sv
^{240}Pu	2.933 kg	12.22 M	24.74 TBq	8.435 GBq	α	6.563 ky	5.253 MeV	20.82 W	7.099 mW	6.185 MSv	2.109 kSv
^{241}Pu	1.794 kg	7.442 M	6.841×10^{6}	3.813 TBq	β	14.33 y	5.231 keV	5.733 W	3.196 mW	32.84 MSv	18.30 kSv
^{242}Pu	873.8 gm	3.610 M	123.5 GBq	141.3 MBq	α	373.5 ky	4.982 MeV	98.57 mW	112.8 μW	29.64 kSv	33.92 Sv
^{243}Pu	214.6 mg	882.9 μM	2.067×10^{7}	9.632×10^{7}	β	4.956 h	194.7 keV	644.7 W	3.004 kW	1.757 MSv	8.187 MSv
^{244}Pu	31.02 mg	127.1 μM	20.36 kBq	656.4 kBq	α	80.00 My	4.893 MeV	15.96 nW	514.5 nW	4.886 mSv	157.5 mSv
^{245}Pu	695.7 ng	2.839 nM	31.08 GBq	4.467×10^{7}	β	10.50 h	399.9 keV	1.991 mW	2.862 kW	22.38 Sv	32.17 MSv
^{246}Pu	4.855 ng	19.73 pM	8.791 MBq	1.811×10^{6}	β	10.85 d	142.0 keV	200.0 nW	41.19 W	29.01 mSv	5.975 MSv
C $_{94}$Pu	11.99 kg	49.99 M	2.774×10^{7}	2.314 TBq				852.1 W	71.08 mW	87.73 MSv	7.319 kSv
^{241}Cm	14.06 μg	58.33 nM	7.833 GBq	557.1 TBq	ϵ	32.80 d	693.5 keV	870.3 μW	61.90 W	7.128 Sv	507.0 kSv
^{242}Cm	25.30 gm	104.5 mM	3.096×10^{6}	122.4 TBq	α	162.9 d	6.216 MeV	3.083 kW	121.9 W	37.15 MSv	1.468 MSv
^{243}Cm	747.0 mg	3.073 mM	1.427 TBq	1.910 TBq	α	30.00 y	6.190 MeV	1.415 W	1.894 W	214.1 kSv	286.5 kSv
^{244}Cm	84.78 gm	347.4 mM	253.9 TBq	2.995 TBq	α	18.00 y	5.900 MeV	240.0 W	2.831 W	30.47 MSv	359.4 kSv
^{245}Cm	5.620 gm	22.93 mM	35.72 GBq	6.356 GBq	α	8.500 ky	5.597 MeV	32.03 mW	5.699 mW	7.501 kSv	1.335 kSv
^{246}Cm	717.6 mg	2.916 mM	8.159 GBq	11.37 GBq	α	4.730 ky	5.524 MeV	7.220 mW	10.06 mW	1.713 kSv	2.388 kSv
^{247}Cm	9.829 mg	39.78 μM	33.76 kBq	3.435 MBq	α	16.00 My	5.390 MeV	29.15 nW	2.966 μW	6.414 mSv	652.6 mSv
^{248}Cm	759.5 μg	3.062 μM	119.5 kBq	157.3 MBq	α	340.0 ky	21.00 MeV	402.1 nW	529.4 μW	92.01 mSv	121.2 Sv
^{249}Cm	9.720 ng	39.02 pM	4.237 GBq	4.359×10^{8}	β	1.069 h	293.5 keV	199.2 μW	20.49 kW	131.3 mSv	13.51 MSv
^{250}Cm	4.600 pg	$\leq$ 1 pM	13.99 mBq	3.041 GBq	SF	8.000 ky	123.3 MeV	$\leq$ 1 pW	60.09 mW	61.56 nSv	13.38 kSv
C $_{96}$Cm	117.2 gm	480.9 mM	3.351×10^{6}	28.60 TBq				3.324 kW	28.37 W	67.84 MSv	579.0 kSv
^{230}U	2.768 pg	$\leq$ 1 pM	2.797 kBq	1.010×10^{6}	α	20.80 d	5.990 MeV	2.684 nW	969.7 W	156.6 μSv	56.59 MSv
^{231}U	169.2 pg	$\leq$ 1 pM	842.5 kBq	4.979×10^{6}	ϵ	4.200 d	139.5 keV	18.83 nW	111.3 W	235.9 μSv	1.394 MSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{232}U	441.1 μg	1.901 μM	349.4 MBq	792.1 GBq	α	69.80 y	5.417 MeV	303.2 μW	687.4 mW	115.3 Sv	261.4 kSv
^{233}U	1.920 mg	8.239 μM	688.2 kBq	358.4 MBq	α	159.3 ky	4.903 MeV	540.6 nW	281.6 μW	35.10 mSv	18.28 Sv
^{234}U	168.9 gm	721.7 mM	39.07 GBq	231.3 MBq	α	245.7 ky	4.860 MeV	30.42 mW	180.1 μW	1.914 kSv	11.33 Sv
^{235}U	7.416 kg	31.55 M	593.5 MBq	80.03 kBq	α	703.8 My	4.417 MeV	420.0 μW	56.63 nW	27.89 Sv	3.761 mSv
^{236}U	5.523 kg	23.40 M	13.22 GBq	2.394 MBq	α	23.70 My	4.572 MeV	9.683 mW	1.753 μW	621.3 Sv	112.5 mSv
^{237}U	11.55 gm	48.72 mM	3.489×10^{7}	3.021×10^{6}	β	6.750 d	319.2 keV	1.784 kW	154.5 W	26.52 MSv	2.296 MSv
^{238}U	921.7 kg	3.872 kM	11.47 GBq	12.44 kBq	α	4.468 Gy	4.279 MeV	7.863 mW	8.531 nW	516.2 Sv	560.0 μSv
^{239}U	658.8 mg	2.756 mM	8.151×10^{8}	1.237×10^{9}	β	23.47 m	454.2 keV	59.31 kW	90.03 kW	22.01 MSv	33.41 MSv
^{240}U	27.21 μg	113.3 nM	932.8 GBq	3.428×10^{7}	β	14.10 h	138.4 keV	20.68 mW	760.0 W	1.026 kSv	37.71 MSv
^{241}U	$\leq$ 1 pg	$\leq$ 1 pM	1.744 MBq	1.734×10^{12}	β	5.000 m	404.1 keV	112.9 nW	112.2 MW		
C $_{92}$U	934.8 kg	3.928 kM	8.500×10^{8}	909.3 GBq				61.09 kW	65.35 mW	48.53 MSv	51.91 Sv
^{240}Am	3.533 μg	14.72 nM	33.61 GBq	9.513×10^{6}	ϵ	2.117 d	1.104 MeV	5.945 mW	1.683 kW	19.49 Sv	5.518 MSv
^{241}Am	59.86 gm	248.3 mM	7.604 TBq	127.0 GBq	α	432.8 y	5.605 MeV	6.828 W	114.1 mW	1.521 MSv	25.41 kSv
^{242}Am	166.7 mg	688.7 μM	4.988×10^{6}	2.992×10^{7}	β	16.04 h	191.5 keV	153.0 W	917.8 W	1.496 MSv	8.977 MSv
^{242m}Am	793.9 mg	3.280 mM	285.6 GBq	359.7 GBq	γ	141.0 y	66.64 keV	3.049 mW	3.841 mW	54.26 kSv	68.35 kSv
^{243}Am	196.8 gm	809.7 mM	1.453 TBq	7.383 GBq	α	7.365 ky	5.421 MeV	1.262 W	6.413 mW	290.6 kSv	1.477 kSv
^{244}Am	188.9 mg	774.0 μM	8.891×10^{6}	4.707×10^{7}	β	10.10 h	883.9 keV	1.259 kW	6.665 kW	4.090 MSv	21.65 MSv
^{245}Am	135.9 ng	554.5 pM	31.08 GBq	2.287×10^{8}	β	2.050 h	312.9 keV	1.558 mW	11.46 kW	1.927 Sv	14.18 MSv
^{246}Am	7.769 pg	$\leq$ 1 pM	8.791 MBq	1.132×10^{9}	β	39.00 m	1.362 MeV	1.918 μW	246.9 kW	509.9 μSv	65.63 MSv
C $_{95}$Am	257.8 gm	1.063 M	1.389×10^{7}	53.87 TBq				1.420 kW	5.508 W	7.452 MSv	28.90 kSv
^{226}Th	$\leq$ 1 pg	$\leq$ 1 pM	2.797 kBq	9.936×10^{8}	α	30.57 m	6.450 MeV	2.890 nW	1.027 MW	978.9 nSv	347.8 MSv
^{227}Th	26.70 pg	$\leq$ 1 pM	30.38 kBq	1.138×10^{6}	α	18.72 d	6.158 MeV	29.97 nW	1.122 kW	267.3 μSv	10.01 MSv
^{228}Th	2.941 μg	12.90 nM	89.21 MBq	30.33 TBq	α	1.913 y	5.518 MeV	78.86 μW	26.81 W	6.423 Sv	2.184 MSv
^{229}Th	870.1 ng	3.799 nM	6.852 kBq	7.875 GBq	α	7.340 ky	5.161 MeV	5.665 nW	6.511 mW	3.357 mSv	3.859 kSv
^{230}Th	1.626 mg	7.069 μM	1.215 MBq	747.2 MBq	α	75.40 ky	4.773 MeV	929.0 nW	571.3 μW	255.2 mSv	156.9 Sv
^{231}Th	1.895 μg	8.202 nM	37.30 GBq	1.968×10^{7}	β	1.063 d	94.65 keV	565.6 μW	298.5 W	12.68 Sv	6.692 MSv
^{232}Th	372.9 μg	1.607 μM	1.514 Bq	4.060 kBq	α	14.05 Gy	4.083 MeV	$\leq$ 1 pW	2.656 nW	348.2 nSv	933.8 μSv
^{233}Th	763.9 pg	3.278 pM	1.033 GBq	1.352×10^{9}	β	22.30 m	426.8 keV	70.63 μW	92.46 kW		
^{234}Th	13.39 μg	57.21 nM	11.48 GBq	857.4 TBq	β	24.09 d	68.40 keV	125.8 μW	9.395 W	39.03 Sv	2.915 MSv
C $_{90}$Th	2.018 mg	8.758 μM	49.90 GBq	24.73 TBq				841.9 μW	417.2 mW	58.40 Sv	28.94 kSv
^{231}Pa	491.0 μg	2.125 μM	858.4 kBq	1.748 GBq	α	32.76 ky	5.084 MeV	699.1 nW	1.424 mW	609.5 mSv	1.241 kSv
^{232}Pa	1.849 μg	7.969 nM	29.40 GBq	1.590×10^{7}	β	1.310 d	1.103 MeV	5.196 mW	2.810 kW	21.17 Sv	11.45 MSv
^{233}Pa	21.80 μg	93.55 nM	16.75 GBq	768.3 TBq	β	27.00 d	383.1 keV	1.028 mW	47.16 W	14.57 Sv	668.5 kSv
^{234}Pa	3.601 ng	15.39 pM	266.4 MBq	7.398×10^{7}	β	6.780 h	2.423 MeV	103.4 μW	28.71 kW	135.9 mSv	37.73 MSv
^{234m}Pa	461.6 pg	1.972 pM	11.73 GBq	2.541×10^{10}	β	1.170 m	833.9 keV	1.567 mW	3.395 MW		
^{235}Pa	$\leq$ 1 pg	$\leq$ 1 pM	9.124 kBq	1.229×10^{9}	β	24.20 m	471.0 keV	688.4 pW	92.73 kW		
C $_{91}$Pa	514.7 μg	2.227 μM	58.15 GBq	113.0 TBq				7.895 mW	15.34 W	36.49 Sv	70.89 kSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{222}Ra	$\leq$ 1 pg	$\leq$ 1 pM	2.797 kBq	4.950×10^{10}	α	38.00 s	6.679 MeV	2.993 nW	52.97 MW		
^{223}Ra	16.30 pg	$\leq$ 1 pM	30.91 kBq	1.896×10^{6}	α	11.43 d	6.006 MeV	29.74 nW	1.825 kW	3.091 mSv	189.6 MSv
^{224}Ra	15.22 ng	67.94 pM	89.73 MBq	5.896×10^{6}	α	3.640 d	5.791 MeV	83.24 μW	5.469 kW	5.832 Sv	383.2 MSv
^{225}Ra	12.46 pg	$\leq$ 1 pM	18.08 kBq	1.451×10^{6}	β	14.80 d	118.3 keV	342.7 pW	27.50 W	1.790 mSv	143.7 MSv
^{226}Ra	34.01 ng	150.5 pM	1.245 kBq	36.61 GBq	α	1.600 ky	4.869 MeV	971.2 pW	28.56 mW	348.6 μSv	10.25 kSv
^{228}Ra	$\leq$ 1 pg	$\leq$ 1 pM	197.2 mBq	8.664 TBq	β	5.750 y	13.00 keV	$\leq$ 1 pW	18.04 mW	136.1 nSv	5.978 MSv
E $_{88}$Ra	49.26 ng	218.5 pM	89.78 MBq	1.823×10^{6}				83.27 μW	1.691 kW	5.838 Sv	118.5 MSv
^{249}Cf	1.521 μg	6.107 nM	230.7 kBq	151.7 GBq	α	351.0 y	7.806 MeV	288.5 nW	189.7 mW	80.74 mSv	53.09 kSv
^{250}Cf	2.037 μg	8.146 nM	8.244 MBq	4.047 TBq	α	13.08 y	6.266 MeV	8.276 μW	4.063 W	1.319 Sv	647.5 kSv
^{251}Cf	984.1 ng	3.919 nM	57.76 kBq	58.69 GBq	α	898.0 y	6.029 MeV	55.79 nW	56.69 mW	20.79 mSv	21.13 kSv
^{252}Cf	661.6 ng	2.625 nM	13.17 MBq	19.91 TBq	α	2.645 y	12.04 MeV	25.40 μW	38.39 W	1.185 Sv	1.792 MSv
^{253}Cf	1.033 ng	4.082 pM	1.108 MBq	1.073×10^{6}	β	17.81 d	97.80 keV	17.36 nW	16.81 W	1.551 mSv	1.502 MSv
^{254}Cf	48.02 pg	$\leq$ 1 pM	15.10 kBq	314.5 TBq	SF	60.50 d	199.5 MeV	482.5 nW	10.05 kW	6.040 mSv	125.8 MSv
^{255}Cf	$\leq$ 1 pg	$\leq$ 1 pM	1.736 kBq	3.033×10^{8}	β	1.417 h	99.99 keV	27.81 pW	4.858 kW		
C $_{98}$Cf	5.205 μg	20.80 nM	22.83 MBq	4.386 TBq				34.52 μW	6.632 W	2.613 Sv	502.1 kSv
^{249}Bk	9.142 μg	36.70 nM	554.6 MBq	60.67 TBq	β	320.0 d	124.9 keV	11.10 μW	1.214 W	538.0 mSv	58.85 kSv
^{250}Bk	11.32 ng	45.27 pM	1.629 GBq	1.439×10^{8}	β	3.217 h	1.173 MeV	306.0 μW	27.03 kW	228.1 mSv	20.15 MSv
^{251}Bk	1.374 pg	$\leq$ 1 pM	668.2 kBq	4.863×10^{8}	β	55.60 m	1.100 MeV	117.8 nW	85.74 kW		
C $_{97}$Bk	9.153 μg	36.75 nM	2.184 GBq	238.6 TBq				317.2 μW	34.66 W	766.0 mSv	83.69 kSv
^{206}Pb	$\leq$ 1 pg	$\leq$ 1 pM									
^{207}Pb	466.3 pg	2.253 pM									
^{208}Pb	945.7 ng	4.547 nM									
^{209}Pb	$\leq$ 1 pg	$\leq$ 1 pM	18.17 kBq	1.682×10^{8}	β	3.253 h	194.0 keV	564.6 pW	5.228 kW	1.036 μSv	9.590 MSv
^{210}Pb	51.67 pg	$\leq$ 1 pM	146.0 Bq	2.826 TBq	β	22.16 y	39.09 keV	$\leq$ 1 pW	17.69 mW	100.7 μSv	1.950 MSv
^{211}Pb	$\leq$ 1 pg	$\leq$ 1 pM	30.91 kBq	9.137×10^{8}	β	36.10 m	505.5 keV	2.503 nW	73.99 kW	5.564 μSv	164.5 MSv
^{212}Pb	1.745 ng	8.231 pM	89.73 MBq	5.142×10^{7}	β	10.64 h	321.2 keV	4.618 μW	2.646 kW	538.4 mSv	308.5 MSv
^{214}Pb	$\leq$ 1 pg	$\leq$ 1 pM	1.245 kBq	1.213×10^{9}	β	26.80 m	538.0 keV	107.3 pW	104.6 kW	174.3 nSv	169.9 MSv
A $_{82}$Pb	948.0 ng	4.558 nM	89.78 MBq	94.71 TBq				4.621 μW	4.875 W	538.5 mSv	568.0 kSv
^{225}Ac	8.441 pg	$\leq$ 1 pM	18.13 kBq	2.148×10^{6}	α	10.00 d	5.894 MeV	17.12 nW	2.028 kW	435.1 μSv	51.55 MSv
^{227}Ac	11.98 ng	52.77 pM	32.08 kBq	2.678 TBq	β	21.77 y	81.70 keV	419.9 pW	35.05 mW	35.29 mSv	2.946 MSv
^{228}Ac	5.040 pg	$\leq$ 1 pM	418.5 kBq	8.304×10^{7}	β	6.150 h	1.457 MeV	97.71 nW	19.39 kW	180.0 μSv	35.71 MSv
E $_{89}$Ac	11.99 ng	52.83 pM	468.7 kBq	39.08 TBq				115.2 nW	9.609 W	35.90 mSv	2.994 MSv
^{208}Bi	$\leq$ 1 pg	$\leq$ 1 pM	119.3 nBq	172.9 MBq	ϵ	368.0 ky	2.653 MeV	$\leq$ 1 pW	73.51 μW		
^{209}Bi	195.7 pg	$\leq$ 1 pM	$\leq$ 1 pBq	3.331 μBq	α	$\geq 10^{18}$ y	3.137 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{210}Bi	$\leq$ 1 pg	$\leq$ 1 pM	146.9 Bq	4.595×10^{6}	β	5.012 d	388.8 keV	9.151 pW	286.2 W	191.0 nSv	5.973 MSv
^{210m}Bi	$\leq$ 1 pg	$\leq$ 1 pM	90.32 nBq	21.00 MBq	α	3.000 My	5.296 MeV	$\leq$ 1 pW	17.82 μW	$\leq$ 1 pSv	315.1 mSv
^{211}Bi	$\leq$ 1 pg	$\leq$ 1 pM	30.91 kBq	1.549×10^{10}	α	2.170 m	6.729 MeV	33.32 nW	16.69 MW		

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{212}Bi	165.5 pg	≤ 1 pM	89.73 MBq	5.422×10^{8}	β	1.009 h	2.870 MeV	41.25 μW	249.2 kW	23.33 mSv	141.0 MSv
^{213}Bi	≤ 1 pg	≤ 1 pM	18.13 kBq	7.158×10^{8}	β	45.59 m	709.2 keV	2.060 nW	81.33 kW	3.626 μSv	143.2 MSv
^{214}Bi	≤ 1 pg	≤ 1 pM	1.245 kBq	1.634×10^{9}	β	19.90 m	2.162 MeV	431.3 pW	566.0 kW	137.0 nSv	179.7 MSv
A $_{83}$Bi	361.3 pg	1.717 pM	89.78 MBq	2.485×10^{8}				41.29 μW	114.3 kW	23.33 mSv	64.59 MSv
^{253}Es	815.0 pg	3.220 pM	760.7 kBq	933.4 TBq	α	20.47 d	97.81 keV	11.92 nW	14.63 W	4.640 mSv	5.694 MSv
^{254}Es	155.8 pg	≤ 1 pM	10.76 kBq	69.06 TBq	α	275.7 d	6.619 MeV	11.41 nW	73.23 W	301.3 μSv	1.934 MSv
^{254m}Es	4.902 pg	≤ 1 pM	56.98 kBq	1.162×10^{7}	β	1.638 d	8.171 MeV	74.59 nW	15.22 kW	239.3 μSv	48.82 MSv
^{255}Es	2.789 pg	≤ 1 pM	1.356 kBq	486.2 TBq	β	39.80 d	7.370 MeV	1.601 nW	574.0 W		
C $_{99}$Es	978.5 pg	3.864 pM	829.8 kBq	848.0 TBq				99.52 nW	101.7 W	5.181 mSv	5.295 MSv
^{210}Po	≤ 1 pg	≤ 1 pM	95.09 Bq	166.3 TBq	α	138.4 d	5.408 MeV	82.39 pW	144.1 W	114.1 μSv	199.5 MSv
^{211}Po	≤ 1 pg	≤ 1 pM	86.54 Bq	3.534×10^{12}	α	516.0 ms	7.595 MeV	105.3 pW	4.300 GW		
^{215}Po	≤ 1 pg	≤ 1 pM	30.91 kBq	1.091×10^{15}	α	1.780 ms	7.530 MeV	37.29 nW	1.317×10^{12}		
^{216}Po	≤ 1 pg	≤ 1 pM	89.73 MBq	1.289×10^{13}	α	150.0 ms	6.907 MeV	99.29 μW	14.26 GW		
^{218}Po	≤ 1 pg	≤ 1 pM	1.245 kBq	1.046×10^{10}	α	3.098 m	6.117 MeV	1.220 nW	10.25 MW		
A $_{84}$Po	≤ 1 pg	≤ 1 pM	89.76 MBq	1.550×10^{11}				99.33 μW	171.6 MW	114.1 μSv	197.1 MSv
^{221}Fr	≤ 1 pg	≤ 1 pM	18.13 kBq	6.559×10^{9}	α	4.900 m	6.511 MeV	18.91 nW	6.842 MW		
^{223}Fr	≤ 1 pg	≤ 1 pM	442.9 Bq	1.432×10^{9}	β	21.80 m	437.9 keV	31.07 pW	100.5 kW	1.063 μSv	3.438 GSv
C $_{87}$Fr	≤ 1 pg	≤ 1 pM	18.57 kBq	6.044×10^{9}				18.94 nW	6.163 MW	1.063 μSv	345.9 MSv
$^{250}_{0}$Sf	6.304 μg										
G $^{4}_{2}$He	838.3 mg	209.4 mM									
^{207}Tl	≤ 1 pg	≤ 1 pM	30.82 kBq	7.049×10^{9}	β	4.770 m	495.4 keV	2.446 nW	559.5 kW		
^{208}Tl	2.958 pg	≤ 1 pM	32.25 MBq	1.090×10^{10}	β	3.053 m	3.970 MeV	20.51 μW	6.934 MW		
^{209}Tl	≤ 1 pg	≤ 1 pM	391.8 Bq	1.514×10^{10}	β	2.200 m	2.802 MeV	175.9 pW	6.799 MW		
A $_{81}$Tl	2.962 pg	≤ 1 pM	32.28 MBq	1.090×10^{10}				20.51 μW	6.924 MW		
A $^{217}_{85}$At	≤ 1 pg	≤ 1 pM	18.13 kBq	5.958×10^{13}	α	32.30 ms	7.199 MeV	20.91 nW	68.72 GW		
^{219}Rn	≤ 1 pg	≤ 1 pM	30.91 kBq	4.816×10^{11}	α	3.960 s	6.999 MeV	34.66 nW	540.0 MW		
^{220}Rn	2.629 pg	≤ 1 pM	89.73 MBq	3.413×10^{10}	α	55.80 s	6.406 MeV	92.09 μW	35.03 MW		
^{222}Rn	≤ 1 pg	≤ 1 pM	1.245 kBq	5.690×10^{6}	α	3.823 d	5.590 MeV	1.115 nW	5.096 kW		
G $_{86}$Rn	2.848 pg	≤ 1 pM	89.76 MBq	3.152×10^{10}				92.13 μW	32.35 MW		
Total	947.9 kg	3.982 kM	1.730×10^{9}	1.825 TBq				122.8 kW	129.5 mW	880.9 MSv	929.3 Sv

ICRP Publication 119 does not report dose factors for isotopes with half lives less than ten minutes or greater than 10^9 years.
Dose factors for gases are given as Sv/day per Bq/m^3. Radiotoxicity is not computed for gases.

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Activation Products Per Tonne of Fuel

used for 50.68 GW-day LWR burnup at power of 36.5 MW and $3.14 \times 10^{14} N/\mathrm{cm}^2/s$ neutron flux,
at discharge, as calculated by ORIGEN2 version 2.1 on 9 October 2013.
Radiotoxicity in Sieverts computed for adult ingestion using dose factors from ICRP publication 119

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{90}Zr	120.7 kg	1.343 kM									
^{91}Zr	26.41 kg	290.5 M									
^{92}Zr	41.10 kg	447.2 M									
^{93}Zr	160.7 gm	1.730 M	14.95 GBq	93.03 MBq	β	1.530 My	19.59 keV	46.93 μW	292.0 nW	16.44 Sv	102.3 mSv
^{94}Zr	42.60 kg	453.6 M	1.000 kBq	23.48 mBq	2β	6.000 Py	1.144 MeV	183.2 pW	$\leq$ 1 pW		
^{95}Zr	2.447 gm	25.78 mM	1.946×10^{6}	795.3 TBq	β	64.03 d	854.5 keV	266.4 W	108.9 W	1.849 MSv	755.5 kSv
^{96}Zr	6.957 kg	72.54 M	24.60 mBq	3.536 μBq	2β	$\geq 10^{18}$ y	3.350 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{97}Zr	43.49 mg	448.8 μM	3.077×10^{6}	7.075×10^{7}	β	16.74 h	879.2 keV	433.4 W	9.966 kW	6.462 MSv	148.6 MSv
A $_{40}$Zr	237.9 kg	2.608 kM	5.023×10^{6}	21.11 GBq				699.8 W	2.941 mW	8.310 MSv	34.93 Sv
^{92}Nb	2.172 pg	$\leq$ 1 pM	11.23 kBq	5.170×10^{6}	ϵ	35.00 My	1.510 MeV	2.717 nW	1.251 kW		
^{93}Nb	13.59 μg	146.3 nM									
^{93m}Nb	114.9 μg	1.237 μM	1.202 GBq	10.46 TBq	γ	16.13 y	29.90 keV	5.757 μW	50.10 mW	144.2 mSv	1.255 kSv
^{94}Nb	63.43 ng	675.5 pM	439.9 Bq	6.935 GBq	β	19.99 ky	1.718 MeV	121.1 pW	1.909 mW	747.8 nSv	11.79 Sv
^{95}Nb	1.329 gm	14.00 mM	1.924×10^{6}	1.448×10^{6}	β	34.99 d	809.1 keV	249.4 W	187.7 W	1.116 MSv	839.7 kSv
^{95m}Nb	978.7 μg	10.31 μM	13.80 TBq	1.410×10^{7}	γ	3.608 d	234.3 keV	518.1 mW	529.4 W	7.728 kSv	7.896 MSv
^{96}Nb	52.85 μg	551.0 nM	2.735 TBq	5.175×10^{7}	β	23.35 h	2.805 MeV	1.229 W	23.25 kW	3.009 kSv	56.93 MSv
^{97}Nb	3.092 mg	31.91 μM	3.077×10^{6}	9.951×10^{8}	β	1.202 h	1.123 MeV	553.6 W	179.0 kW	209.2 kSv	67.67 MSv
^{97m}Nb	40.58 μg	418.7 nM	2.912×10^{6}	7.176×10^{10}	γ	52.70 s	742.7 keV	346.5 W	8.539 MW		
^{98}Nb	$\leq$ 1 pg	$\leq$ 1 pM	2.579 MBq	1.522×10^{12}	β	2.860 s	2.081 MeV	860.0 nW	507.7 MW		
A $_{41}$Nb	1.333 gm	14.05 mM	7.930×10^{6}	5.947×10^{6}				1.151 kW	863.5 W	1.336 MSv	1.002 MSv
^{89}Y	23.22 mg	261.2 μM									
^{90}Y	3.073 mg	34.18 μM	61.86 TBq	2.013×10^{7}	β	2.671 d	935.3 keV	9.269 W	3.016 kW	167.0 kSv	54.35 MSv
^{90m}Y	10.72 pg	$\leq$ 1 pM	4.459 MBq	4.160×10^{8}	γ	3.190 h	683.0 keV	487.9 nW	45.51 kW	758.0 μSv	70.71 MSv
^{91}Y	4.690 mg	51.59 μM	4.259 TBq	908.1 TBq	β	58.51 d	605.7 keV	413.3 mW	88.12 W	10.22 kSv	2.179 MSv
^{92}Y	30.61 μg	333.0 nM	10.90 TBq	3.561×10^{8}	β	3.540 h	1.699 MeV	2.967 W	96.93 kW	5.341 kSv	174.5 MSv
^{93}Y	9.032 ng	97.21 pM	1.116 GBq	1.236×10^{8}	β	10.18 h	1.261 MeV	225.5 μW	24.97 kW	1.339 Sv	148.3 MSv
^{94}Y	59.97 ng	638.6 pM	232.5 GBq	3.877×10^{9}	β	18.70 m	2.811 MeV	104.7 mW	1.746 MW	18.83 Sv	314.0 MSv
^{96}Y	47.09 pg	$\leq$ 1 pM	1.484 GBq	3.151×10^{10}	β	5.340 s	3.871 MeV	920.2 μW	19.54 MW		
E $_{39}$Y	31.01 mg	347.3 μM	77.25 TBq	2.491×10^{6}				12.76 W	411.3 W	182.6 kSv	5.888 MSv
^{87}Sr	3.321 mg	38.21 μM									
^{88}Sr	325.3 mg	3.701 mM									
^{89}Sr	1.564 mg	17.59 μM	1.682 TBq	1.075×10^{6}	β	50.57 d	583.4 keV	157.2 mW	100.5 W	4.373 kSv	2.796 MSv
^{90}Sr	34.17 μg	380.1 nM	172.5 MBq	5.048 TBq	β	28.79 y	195.8 keV	5.412 μW	158.4 mW	4.830 Sv	141.4 kSv

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{91}Sr	2.422 μg	26.64 nM	325.0 GBq	1.342×10^{8}	β	9.630 h	1.352 MeV	70.39 mW	29.06 kW	211.3 Sv	87.22 MSv
^{93}Sr	111.8 pg	1.203 pM	1.116 GBq	9.982×10^{9}	β	7.423 m	2.554 MeV	456.7 μW	4.085 MW		
E $_{38}$Sr	330.2 mg	3.757 mM	2.008 TBq	6.082 TBq				228.1 mW	690.6 mW	4.589 kSv	13.90 kSv
^{94}Mo	1.739 pg	$\leq$ 1 pM									
^{95}Mo	25.25 gm	266.1 mM									
^{96}Mo	1.824 gm	19.02 mM									
^{97}Mo	48.76 gm	503.2 mM									
^{98}Mo	616.9 mg	6.301 mM	833.5 mBq	1.351 Bq	2β	100.0 Ty	112.0 keV	$\leq$ 1 pW	$\leq$ 1 pW		
^{99}Mo	102.8 μg	1.039 μM	1.825 TBq	1.775×10^{7}	β	2.747 d	541.8 keV	158.4 mW	1.541 kW	1.095 kSv	10.65 MSv
^{100}Mo	1.234 μg	12.35 nM	16.50 pBq	13.37 μBq	2β	$\geq 10^{18}$ y	3.034 MeV	$\leq$ 1 pW	$\leq$ 1 pW		
^{101}Mo	$\leq$ 1 pg	$\leq$ 1 pM	426.2 kBq	4.714×10^{9}	β	14.61 m	1.927 MeV	131.6 nW	1.455 MW	17.47 μSv	193.3 MSv
A $_{42}$Mo	76.45 gm	794.5 mM	1.825 TBq	23.87 GBq				158.4 mW	2.072 mW	1.095 kSv	14.32 Sv
^{98}Tc	4.887 ng	49.91 pM	157.2 mBq	32.17 MBq	β	4.200 My	1.532 MeV	$\leq$ 1 pW	7.892 μW	314.4 pSv	64.33 mSv
^{99}Tc	1.139 mg	11.52 μM	714.8 kBq	627.6 MBq	β	214.0 ky	84.60 keV	9.688 nW	8.506 μW	457.5 μSv	401.6 mSv
^{100}Tc	89.42 pg	$\leq$ 1 pM	23.63 GBq	2.643×10^{11}	β	15.80 s	1.485 MeV	5.622 mW	62.87 MW		
^{101}Tc	$\leq$ 1 pg	$\leq$ 1 pM	426.2 kBq	4.853×10^{9}	β	14.20 m	809.6 keV	55.28 nW	629.5 kW	8.098 μSv	92.21 MSv
A $_{43}$Tc	1.139 mg	11.52 μM	23.63 GBq	20.75 TBq				5.622 mW	4.936 W	465.6 μSv	408.8 mSv
^{98}Ru	$\leq$ 1 pg	$\leq$ 1 pM									
^{99}Ru	3.054 ng	30.88 pM									
^{100}Ru	99.42 μg	995.2 nM									
^{101}Ru	500.4 ng	4.959 nM									
^{102}Ru	9.511 ng	93.33 pM									
^{103}Ru	3.277 pg	$\leq$ 1 pM	3.915 kBq	1.195×10^{6}	β	39.26 d	564.4 keV	354.0 pW	108.0 W	2.858 μSv	872.1 kSv
^{104}Ru	$\leq$ 1 pg	$\leq$ 1 pM									
^{105}Ru	$\leq$ 1 pg	$\leq$ 1 pM	25.47 mBq	2.487×10^{8}	β	4.440 h	1.184 MeV	$\leq$ 1 pW	47.19 kW	6.622 pSv	64.67 MSv
A $_{44}$Ru	99.93 μg	1.000 μM	3.915 kBq	39.18 MBq				354.0 pW	3.542 μW	2.858 μSv	28.60 mSv
^{1}H	12.73 mg	12.63 mM									
^{2}H	10.72 μg	5.322 μM									
^{3}H	7.107 pg	2.356 pM	2.539 kBq	357.3 TBq	β	12.33 y	5.679 keV	2.310 pW	325.0 mW	106.6 nSv	15.00 kSv
G $_{1}$H	12.74 mg	12.64 mM	2.539 kBq	199.3 kBq				2.310 pW	181.3 pW	106.6 nSv	8.370 μSv
^{102}Rh	$\leq$ 1 pg	$\leq$ 1 pM	24.56 μBq	44.74 TBq	ϵ	2.902 y	2.152 MeV	$\leq$ 1 pW	15.42 W	$\leq$ 1 pSv	53.69 kSv
^{103}Rh	$\leq$ 1 pg	$\leq$ 1 pM									
^{104}Rh	$\leq$ 1 pg	$\leq$ 1 pM	65.01 Bq	9.493×10^{10}	β	42.30 s	997.6 keV	10.39 pW	15.17 MW		
^{104m}Rh	$\leq$ 1 pg	$\leq$ 1 pM	4.255 Bq	1.542×10^{10}	γ	4.340 m	140.0 keV	$\leq$ 1 pW	345.8 kW		
^{105}Rh	$\leq$ 1 pg	$\leq$ 1 pM	23.55 mBq	3.124×10^{7}	β	1.473 d	230.9 keV	$\leq$ 1 pW	1.156 kW	8.714 pSv	11.56 MSv
A $_{45}$Rh	$\leq$ 1 pg	$\leq$ 1 pM	69.29 Bq	88.59 TBq				10.49 pW	13.41 W	8.743 pSv	11.18 Sv
^{3}He	$\leq$ 1 pg	$\leq$ 1 pM									

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas

Isotope	Mass		Radioactivity			Half	Energy	Thermal Power		Radiotoxicity	
‡	grams	Moles	GBq	GBq/gm	†	Life	per Bq-s	Watts	Watts/gm	Sv	Sv/gm
^{4}He	16.30 mg	4.072 mM									
G $_{2}$He	16.30 mg	4.072 mM									
^{104}Pd	$\leq$ 1 pg	$\leq$ 1 pM									
^{105}Pd	$\leq$ 1 pg	$\leq$ 1 pM									
^{106}Pd	$\leq$ 1 pg	$\leq$ 1 pM									
A $_{46}$Pd	$\leq$ 1 pg	$\leq$ 1 pM									
Total	238.0 kg	2.609 kM	1.304×10^{7}	54.79 GBq				1.864 kW	7.832 mW	9.835 MSv	41.32 Sv

ICRP Publication 119 does not report dose factors for isotopes with half lives less than ten minutes or greater than 10^{9} years.
Dose factors for gases are given as Sv/day per Bq/m^{3}. Radiotoxicity is not computed for gases.

†First emission from decay with highest branching ratio; ‡Electrorefiner destination: A = anode, C = cathode, E = electrolyte, G = gas