

		Eu-142 (2.34s) ECB+	Eu-143 (2.59m) ECB+	Eu-144 (10.2s) ECB+	Eu-145 (5.93d) ECB+	Eu-146 (4.61d) ECB+	Eu-147 (24.1d) ECB+A
Sm-139 (2.57m) ECB+	Sm-140 (14.82m) ECB+	Sm-141 (11.5m) ECB+	Sm-142 (72.49m) ECB+	Sm-143 (8.1d) ECB+	Sm-144 (STABLE)	Sm-145 (340d) EC	Sm-146 (1.03E+8y) A
	Pm-139 (4.15m) ECB+	Pm-140 (9.2s) ECB+	Pm-141 (1.91m) ECB+	Pm-142 (40.5s) ECB+	Pm-143 (265d) EC	Pm-144 (363d) EC	Pm-145 (17.7y) ECA

SAMARIUM-142

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Sm-142
Atomic number (Z): 62
Mass number (A): 142
Neutron number (N): 80

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 72.49 [m]
Decay constant: 1.5937×10^{-4} [1/s]
Daughters: Pm-142 (100.0%)
Radioactive daughters: Pm-142

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.04458 [MeV]
Mean photon energy: 0.11051 [MeV]
Air kerma rate constant, Γ_{10} : 2.799×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 5.625×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 7.143×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

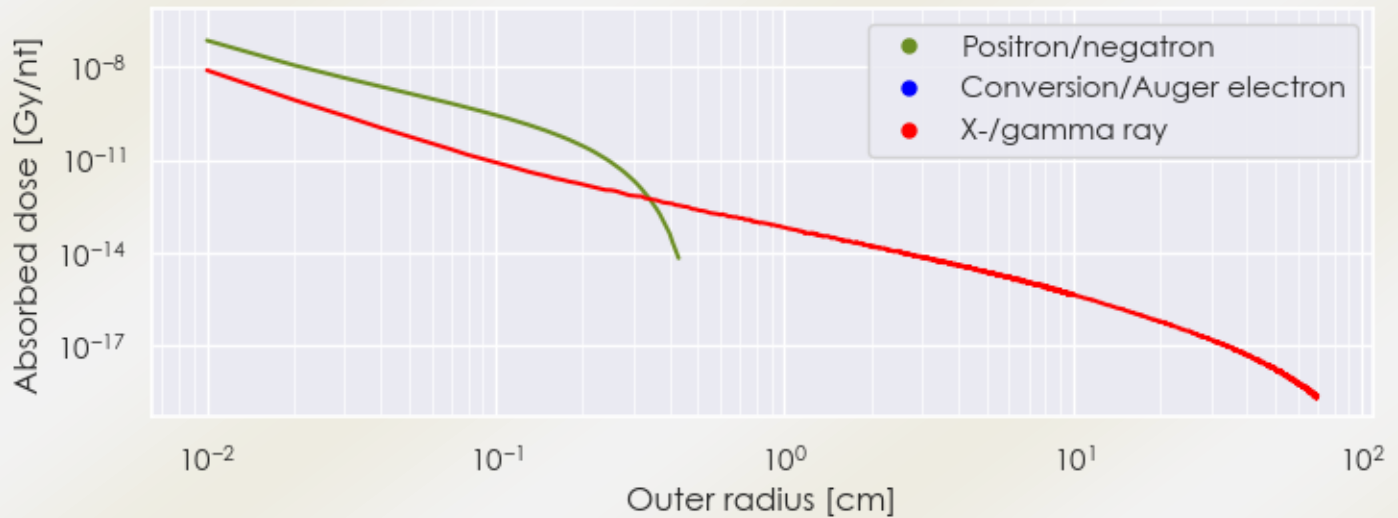
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 7.143×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.771×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

Dose point kernel source: **Graves, et al. Medical Physics. 2019 Nov.; 46(11):5284-5293.**

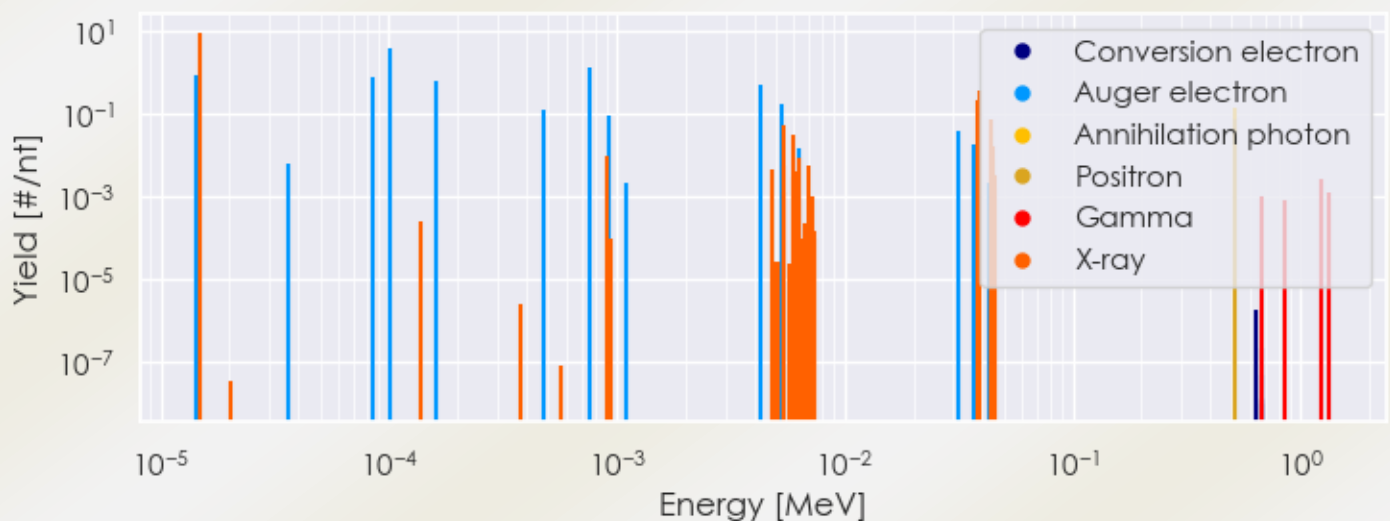
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Sm-142 DPK.csv

SUMMARY SPECTRA (PLOT)

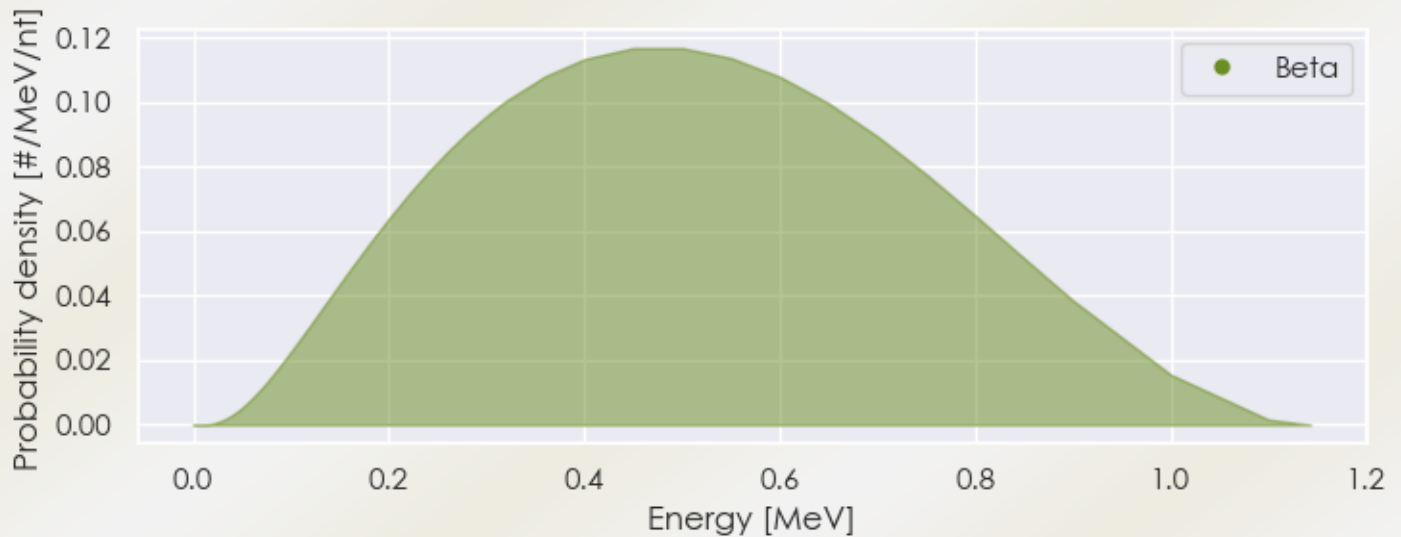
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Sm-142 Summary Spectrum.csv

BETA SPECTRA (PLOT)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated beta spectra file here: www.mirdsoft.org/products/MIRDspecs/Sm-142 Beta Spectrum.csv

TABULATED DATA

SUMMARY SPECTRA (TABLE)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**

Note: Radiations with yield < 0.01 are excluded from the table, but are available in the linked *.csv data.

Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Sm-142 Summary Spectrum.csv

Energy [MeV]	Yield [# /nt] if > 0.01	Radiation type
1.48436e-05	9.393e+00	X-ray
5.41729e-03	5.063e-02	X-ray
5.95960e-03	3.154e-02	X-ray
3.81996e-02	2.074e-01	X-ray
3.87671e-02	3.763e-01	X-ray
4.37575e-02	3.746e-02	X-ray
4.38721e-02	7.249e-02	X-ray
4.49791e-02	1.570e-02	X-ray
5.11000e-01	1.460e-01	Annihilation photon
5.18703e-01	7.300e-02	Positron

1.43706e-05	8.208e-01	Auger electron
8.53241e-05	7.651e-01	Auger electron
1.00558e-04	3.758e+00	Auger electron
1.59760e-04	6.060e-01	Auger electron
4.75932e-04	1.205e-01	Auger electron
7.56038e-04	1.307e+00	Auger electron
9.22902e-04	8.678e-02	Auger electron
4.30091e-03	4.914e-01	Auger electron
5.30090e-03	1.667e-01	Auger electron
6.33450e-03	1.404e-02	Auger electron
3.14373e-02	3.774e-02	Auger electron
3.71303e-02	1.825e-02	Auger electron

USEFUL LINKS

Isotope decay characteristics are periodically updated as better measurements can be made - changes that may not be reflected on this page. Please see useful links:

National Nuclear Data Center (NNDC): <https://www.nndc.bnl.gov/nudat3/mird/>

International Atomic Energy Agency (IAEA) Livechart: <https://www-nds.iaea.org/relnsd/vcharthtml/VChartHTML.html>

REFERENCE LINKS

ICRP Report 107: <https://www.icrp.org/publication.asp?id=ICRP%20Publication%20107>

Graves et al. Dose Point Kernels: <https://doi.org/10.1002/mp.13789>

MIRD Decay Schemes 2nd Edition: https://sites.snmmi.org/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6