



SAMARIUM-141M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Sm-141m
Atomic number (Z): 62
Mass number (A): 141
Neutron number (N): 79

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture, Internal transition
Half-life: 22.6 [m]
Decay constant: 5.1117e-04 [1/s]
Daughters: Pm-141 (99.7%), Sm-141 (0.31%)
Radioactive daughters: Pm-141, Sm-141

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.39951 [MeV]
Mean photon energy: 1.94938 [MeV]
Air kerma rate constant, Γ_{10} : 5.814e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 7.080e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.401e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

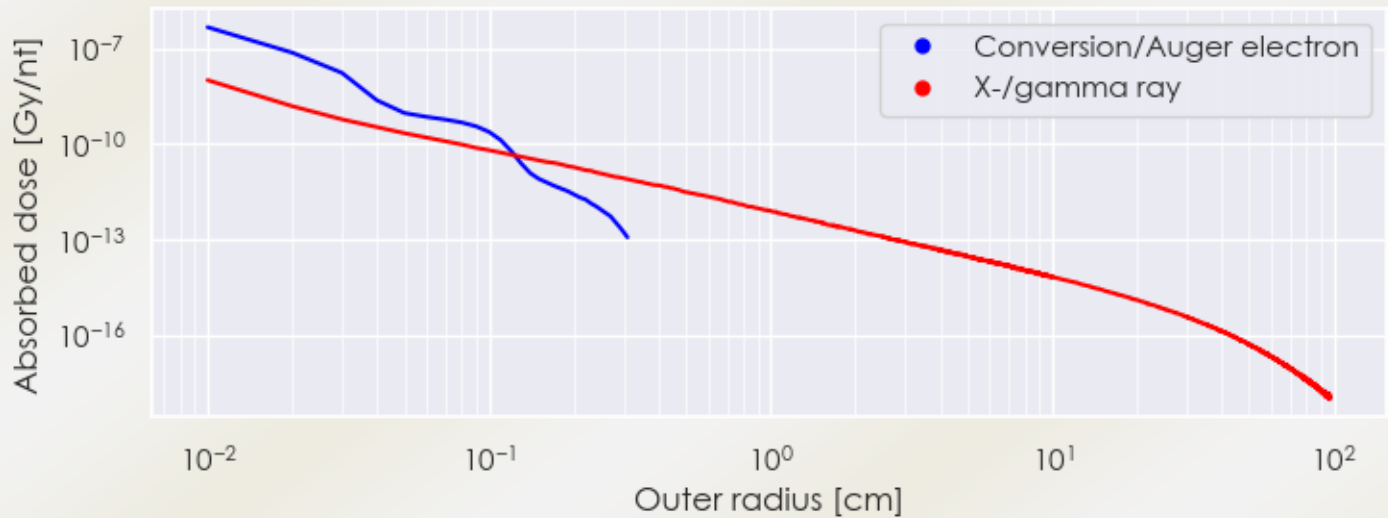
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 6.401×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.123×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

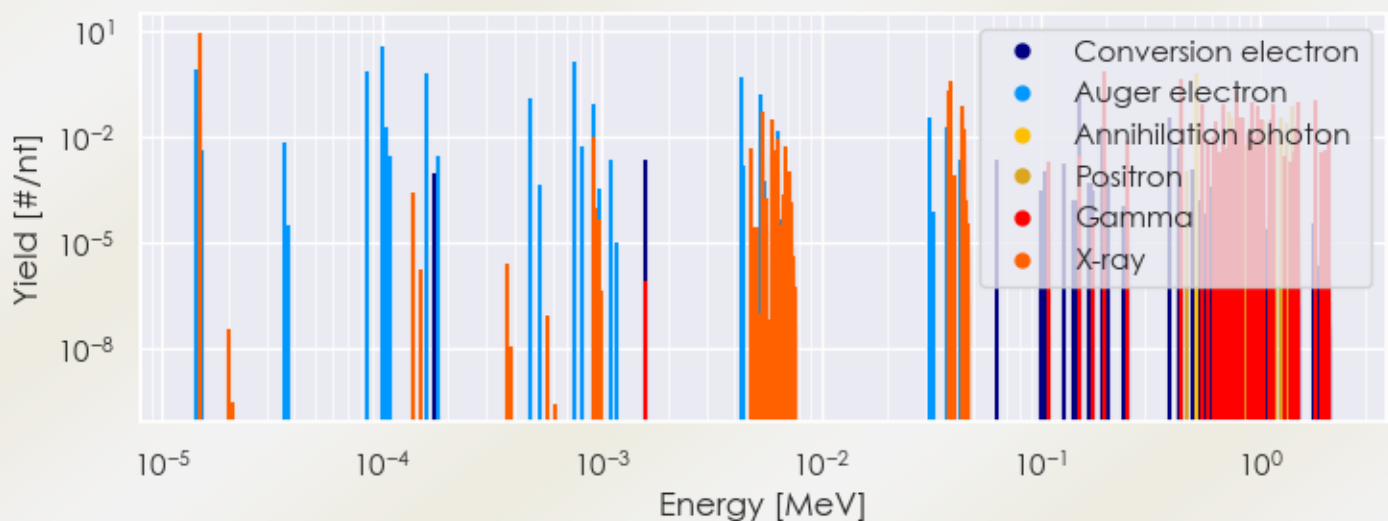
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Sm-141m DPK.csv

SUMMARY SPECTRA (PLOT)

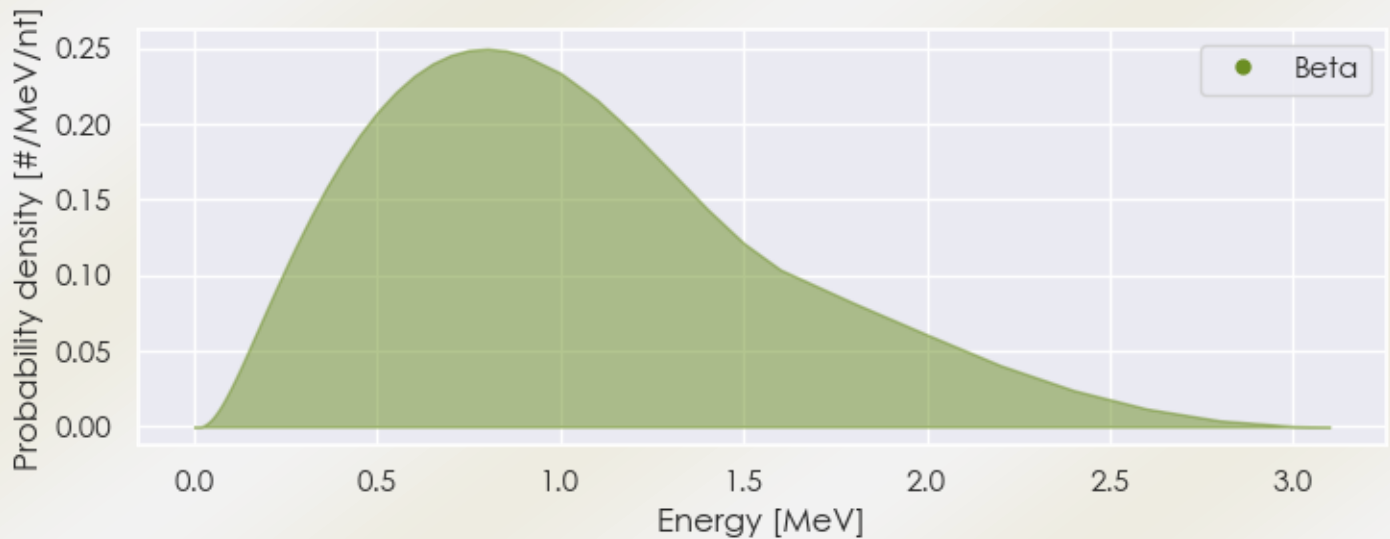
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Sm-141m 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-141m 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-141m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.47901e-05	4.358e-02	X-ray
1.48434e-05	9.101e+00	X-ray
5.41729e-03	4.915e-02	X-ray
5.95960e-03	3.069e-02	X-ray
3.81996e-02	2.014e-01	X-ray
3.87671e-02	3.654e-01	X-ray
4.37575e-02	3.637e-02	X-ray
4.38721e-02	7.038e-02	X-ray
4.49791e-02	1.525e-02	X-ray

1.96600e-01	7.429e-01	Gamma
4.31800e-01	4.037e-01	Gamma
5.11000e-01	6.540e-01	Annihilation photon
5.38500e-01	8.438e-02	Gamma
6.07900e-01	1.009e-02	Gamma
6.28700e-01	2.665e-02	Gamma
6.76800e-01	1.373e-02	Gamma
6.84600e-01	7.913e-02	Gamma
7.25700e-01	1.453e-02	Gamma
7.50300e-01	1.575e-02	Gamma
7.77400e-01	2.031e-01	Gamma
7.85900e-01	6.823e-02	Gamma
8.05900e-01	3.553e-02	Gamma
8.37100e-01	3.593e-02	Gamma
8.75000e-01	1.252e-02	Gamma
8.96500e-01	1.453e-02	Gamma
9.11300e-01	9.205e-02	Gamma
9.24700e-01	2.301e-02	Gamma
9.83300e-01	7.267e-02	Gamma
1.00910e+00	2.907e-02	Gamma
1.10840e+00	1.252e-02	Gamma
1.11760e+00	3.230e-02	Gamma
1.14510e+00	8.721e-02	Gamma
1.46340e+00	1.817e-02	Gamma
1.49030e+00	9.246e-02	Gamma
1.78640e+00	1.094e-01	Gamma
2.07370e+00	1.413e-02	Gamma
7.26181e-01	4.766e-02	Positron
7.38441e-01	3.527e-02	Positron
7.87080e-01	3.813e-02	Positron
1.04413e+00	2.521e-02	Positron
1.09047e+00	1.377e-02	Positron
1.15723e+00	1.726e-02	Positron
1.24590e+00	3.283e-02	Positron
1.30894e+00	2.288e-02	Positron
1.40526e+00	7.626e-02	Positron
1.43706e-05	7.953e-01	Auger electron
8.52994e-05	7.414e-01	Auger electron

1.00562e-04	3.641e+00	Auger electron
1.05031e-04	1.880e-02	Auger electron
1.59780e-04	5.864e-01	Auger electron
4.75183e-04	1.157e-01	Auger electron
7.55995e-04	1.267e+00	Auger electron
9.22786e-04	8.413e-02	Auger electron
4.30035e-03	4.767e-01	Auger electron
5.30024e-03	1.616e-01	Auger electron
6.33369e-03	1.362e-02	Auger electron
3.14373e-02	3.665e-02	Auger electron
3.71303e-02	1.772e-02	Auger electron
1.51381e-01	1.504e-01	Conversion electron
1.89206e-01	1.930e-02	Conversion electron
3.86581e-01	3.427e-02	Conversion 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