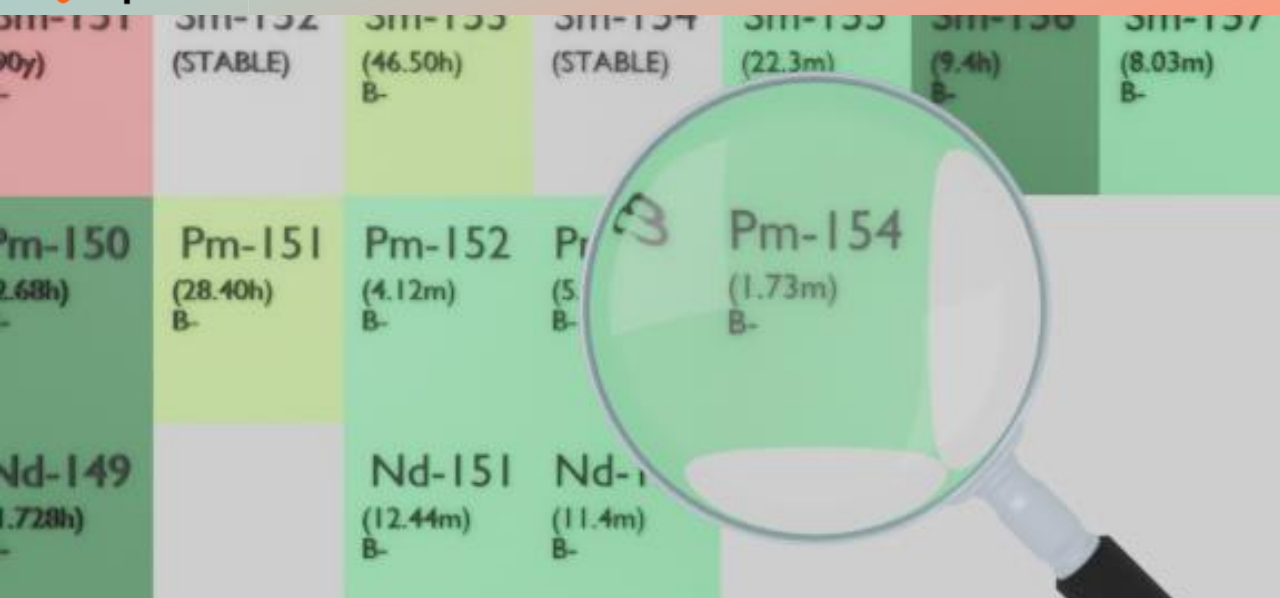




PROMETHIUM-154

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pm-154
Atomic number (Z): 61
Mass number (A): 154
Neutron number (N): 93

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 1.73 [m]
Decay constant: 6.6777×10^{-3} [1/s]
Daughters: Sm-154 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.87055 [MeV]
Mean photon energy: 1.79326 [MeV]
Air kerma rate constant, Γ_{10} : 5.833×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 5.833×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.395×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

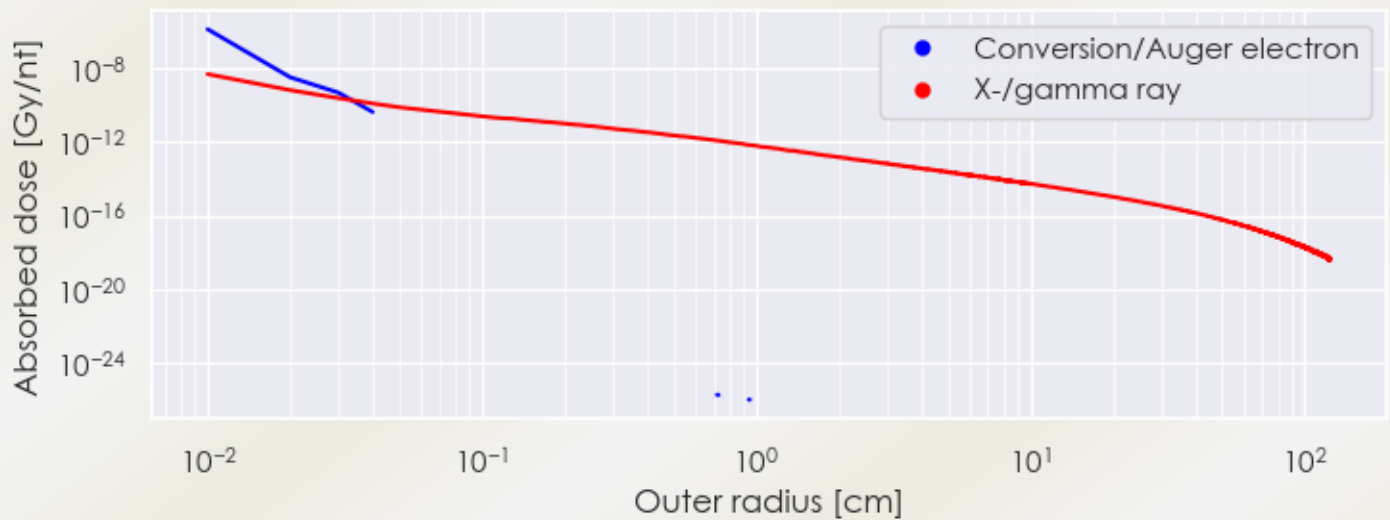
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.395×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.873×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

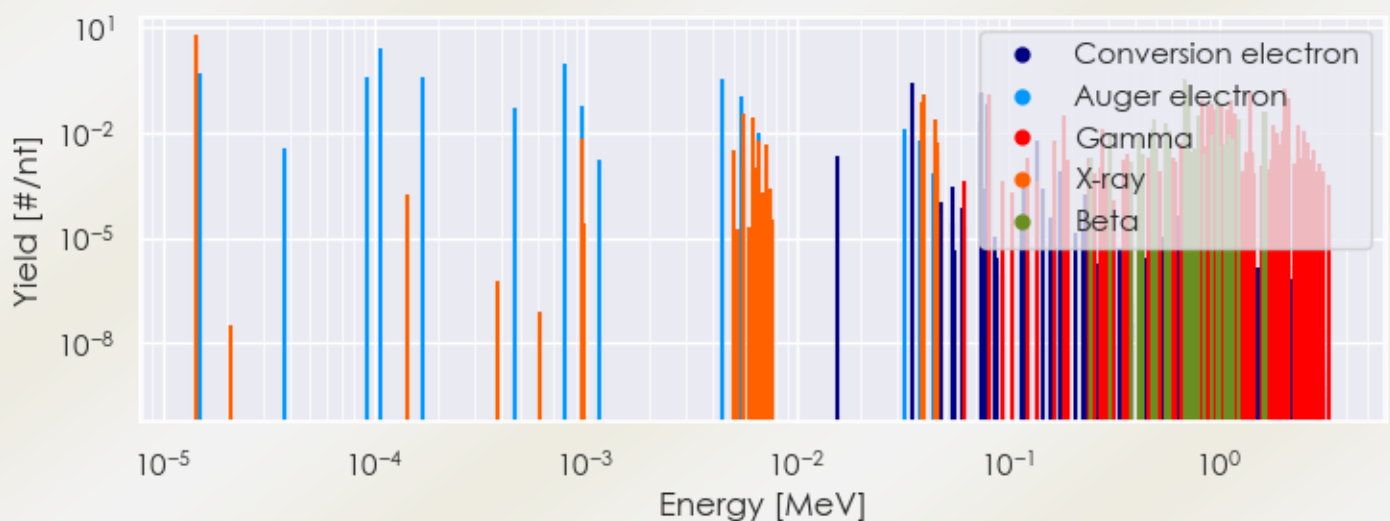
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Pm-154 DPK.csv

SUMMARY SPECTRA (PLOT)

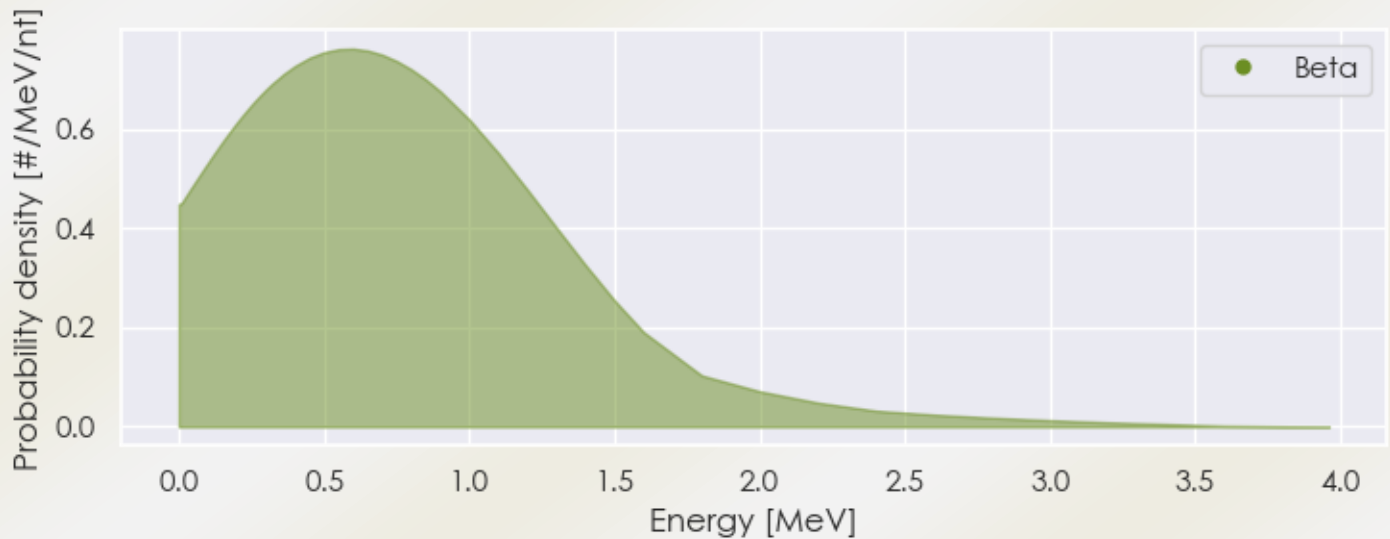
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Pm-154 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/Pm-154 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/Pm-154 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.45299e-05	5.864e+00	X-ray
5.62210e-03	3.422e-02	X-ray
6.20530e-03	2.672e-02	X-ray
3.95578e-02	6.940e-02	X-ray
4.01680e-02	1.256e-01	X-ray
4.53440e-02	1.259e-02	X-ray
4.54683e-02	2.435e-02	X-ray
8.20160e-02	1.260e-01	Gamma
1.84810e-01	3.100e-02	Gamma
2.80960e-01	1.230e-02	Gamma

8.39360e-01	8.800e-02	Gamma
8.91280e-01	5.620e-02	Gamma
9.10930e-01	3.100e-02	Gamma
9.21360e-01	6.100e-02	Gamma
9.53970e-01	1.240e-02	Gamma
9.62000e-01	3.380e-02	Gamma
9.69790e-01	4.650e-02	Gamma
1.01721e+00	6.300e-02	Gamma
1.09584e+00	4.400e-02	Gamma
1.14769e+00	7.900e-02	Gamma
1.17775e+00	3.240e-02	Gamma
1.39358e+00	1.440e-01	Gamma
1.80817e+00	1.550e-02	Gamma
1.89000e+00	1.030e-02	Gamma
1.98704e+00	1.060e-02	Gamma
2.05776e+00	1.710e-01	Gamma
2.06904e+00	1.630e-02	Gamma
2.13976e+00	9.700e-02	Gamma
2.34648e+00	1.700e-02	Gamma
2.50927e+00	1.100e-02	Gamma
3.04010e-01	1.006e-02	Beta
4.81062e-01	1.232e-02	Beta
4.92336e-01	2.259e-02	Beta
5.61721e-01	1.745e-02	Beta
5.87425e-01	1.047e-02	Beta
6.87153e-01	3.388e-01	Beta
6.90661e-01	2.259e-02	Beta
7.18270e-01	2.228e-01	Beta
7.97535e-01	3.080e-02	Beta
9.83530e-01	1.478e-01	Beta
1.23574e+00	2.259e-02	Beta
1.62192e+00	4.107e-02	Beta
1.65980e+00	4.107e-02	Beta
1.51033e-05	4.557e-01	Auger electron
9.34272e-05	3.794e-01	Auger electron
1.06822e-04	2.444e+00	Auger electron
1.70790e-04	3.848e-01	Auger electron
4.65439e-04	5.322e-02	Auger electron

8.03303e-04	8.561e-01	Auger electron
9.71954e-04	5.464e-02	Auger electron
4.45187e-03	3.151e-01	Auger electron
5.49930e-03	1.077e-01	Auger electron
3.25196e-02	1.198e-02	Auger electron
3.51400e-02	2.494e-01	Conversion electron
7.43137e-02	2.204e-02	Conversion electron
7.46978e-02	1.260e-01	Conversion electron
7.53081e-02	1.390e-01	Conversion electron
8.06083e-02	6.686e-02	Conversion electron
8.20160e-02	1.739e-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