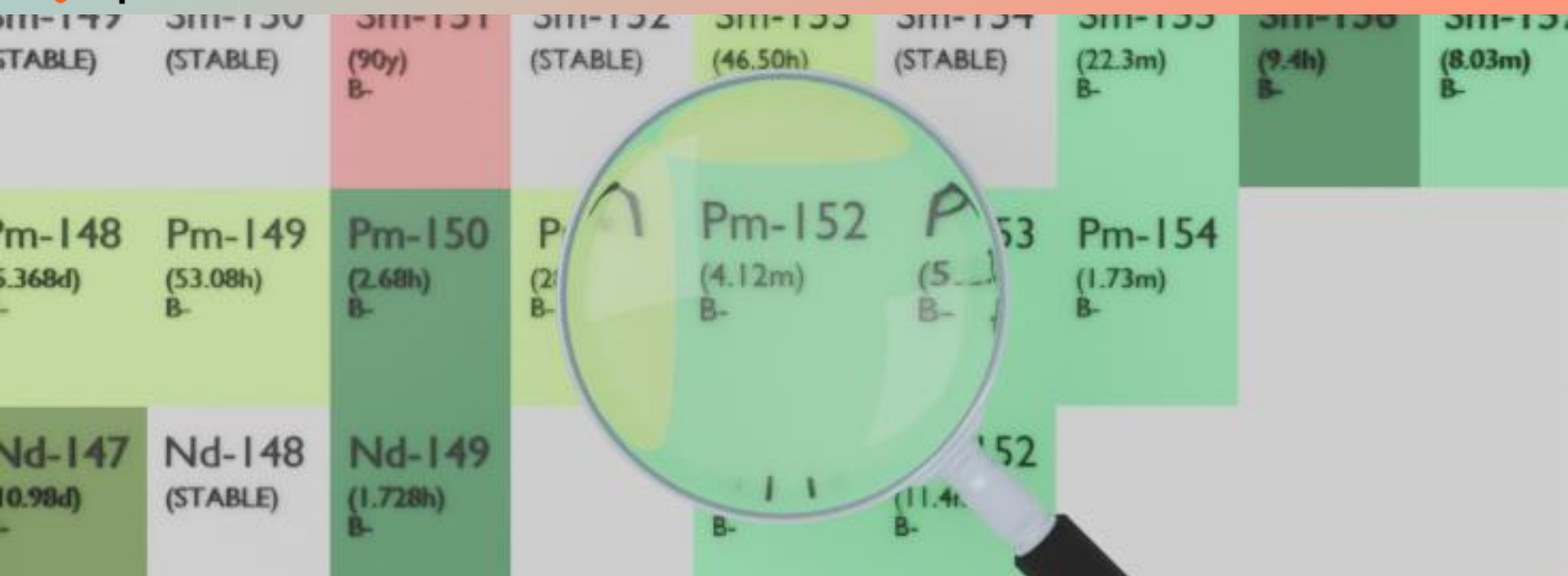




PROMETHIUM-152

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pm-152
Atomic number (Z): 61
Mass number (A): 152
Neutron number (N): 91

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 4.12 [m]
Decay constant: 2.8040×10^{-3} [1/s]
Daughters: Sm-152 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.32829 [MeV]
Mean photon energy: 0.28658 [MeV]
Air kerma rate constant, Γ_{10} : 1.007×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.007×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.128×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

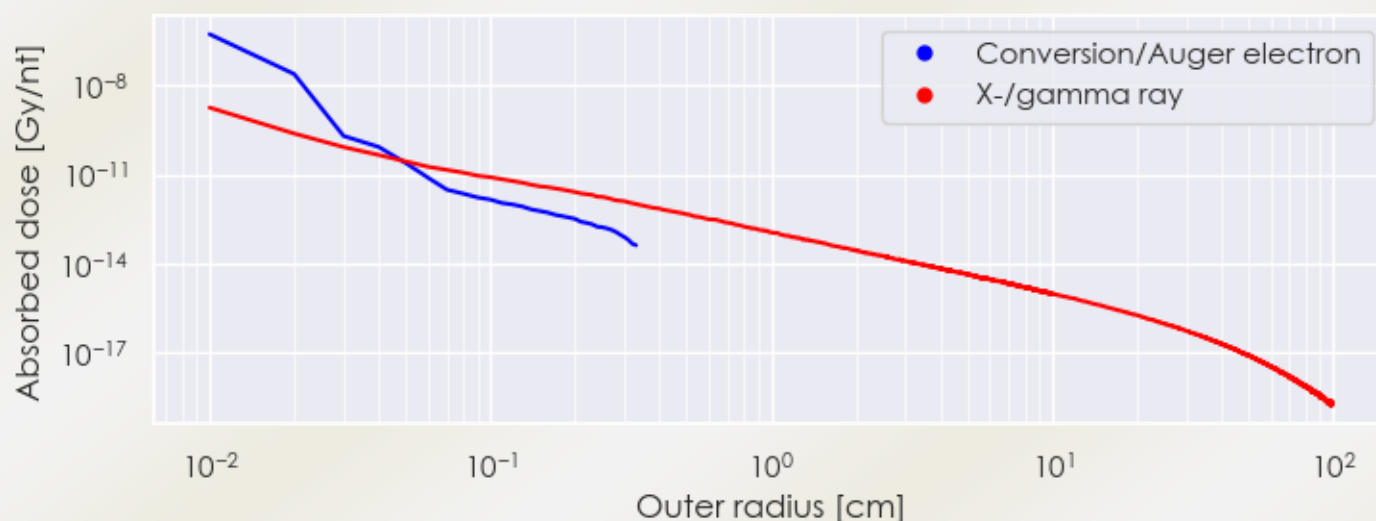
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 2.128×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.592×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

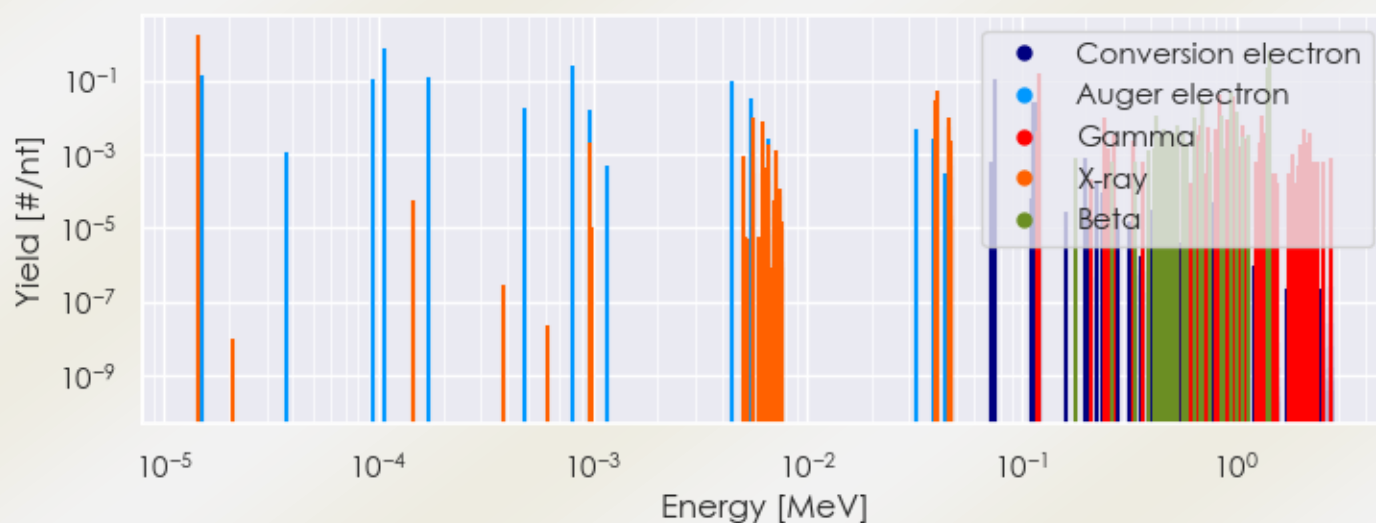
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Pm-152 DPK.csv

SUMMARY SPECTRA (PLOT)

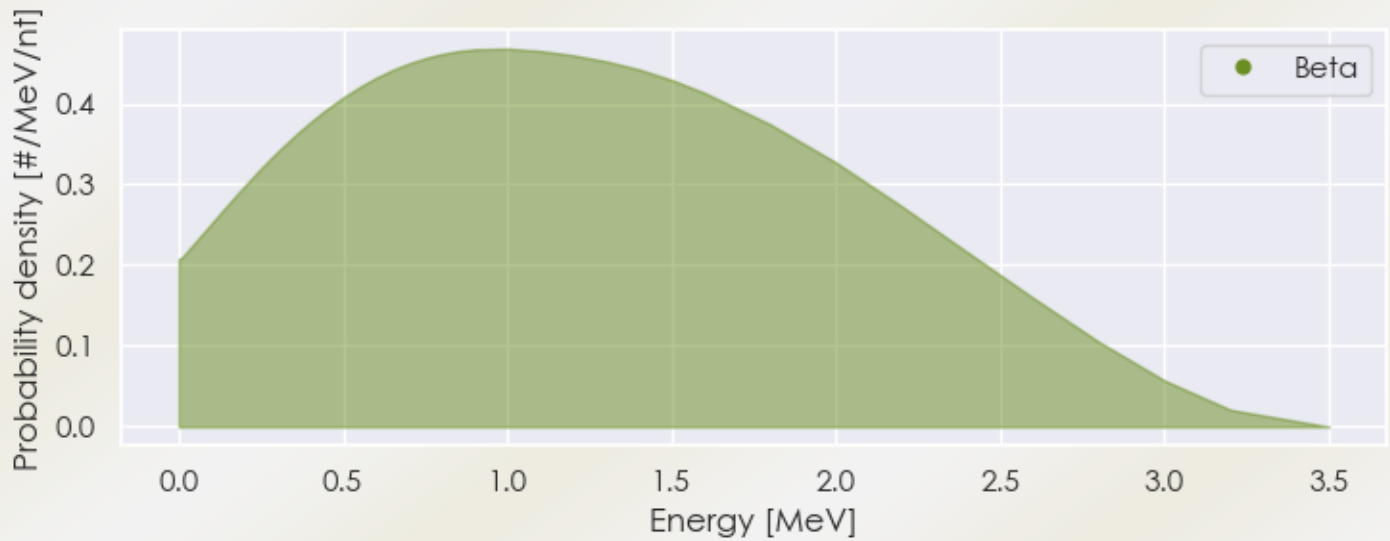
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Pm-152 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-152 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-152 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.45298e-05	1.749e+00	X-ray
5.62210e-03	1.024e-02	X-ray
3.95578e-02	2.891e-02	X-ray
4.01680e-02	5.233e-02	X-ray
4.54683e-02	1.015e-02	X-ray
1.21800e-01	1.570e-01	Gamma
6.95900e-01	2.606e-02	Gamma
8.41400e-01	4.051e-02	Gamma
9.60900e-01	3.674e-02	Gamma
9.63300e-01	3.564e-02	Gamma

1.32160e+00	1.068e-02	Gamma
4.28032e-01	1.071e-02	Beta
6.96571e-01	2.803e-02	Beta
8.58980e-01	1.041e-02	Beta
9.53266e-01	4.504e-02	Beta
1.00722e+00	1.401e-02	Beta
1.39160e+00	2.102e-01	Beta
1.44765e+00	6.106e-01	Beta
1.51033e-05	1.362e-01	Auger electron
9.36345e-05	1.129e-01	Auger electron
1.06795e-04	7.295e-01	Auger electron
1.70290e-04	1.151e-01	Auger electron
4.80164e-04	1.784e-02	Auger electron
8.03376e-04	2.543e-01	Auger electron
9.72318e-04	1.624e-02	Auger electron
4.45386e-03	9.405e-02	Auger electron
5.50200e-03	3.214e-02	Auger electron
7.49240e-02	1.062e-01	Conversion electron
1.14098e-01	1.002e-02	Conversion electron
1.14482e-01	2.485e-02	Conversion electron
1.15092e-01	2.454e-02	Conversion electron
1.20392e-01	1.374e-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