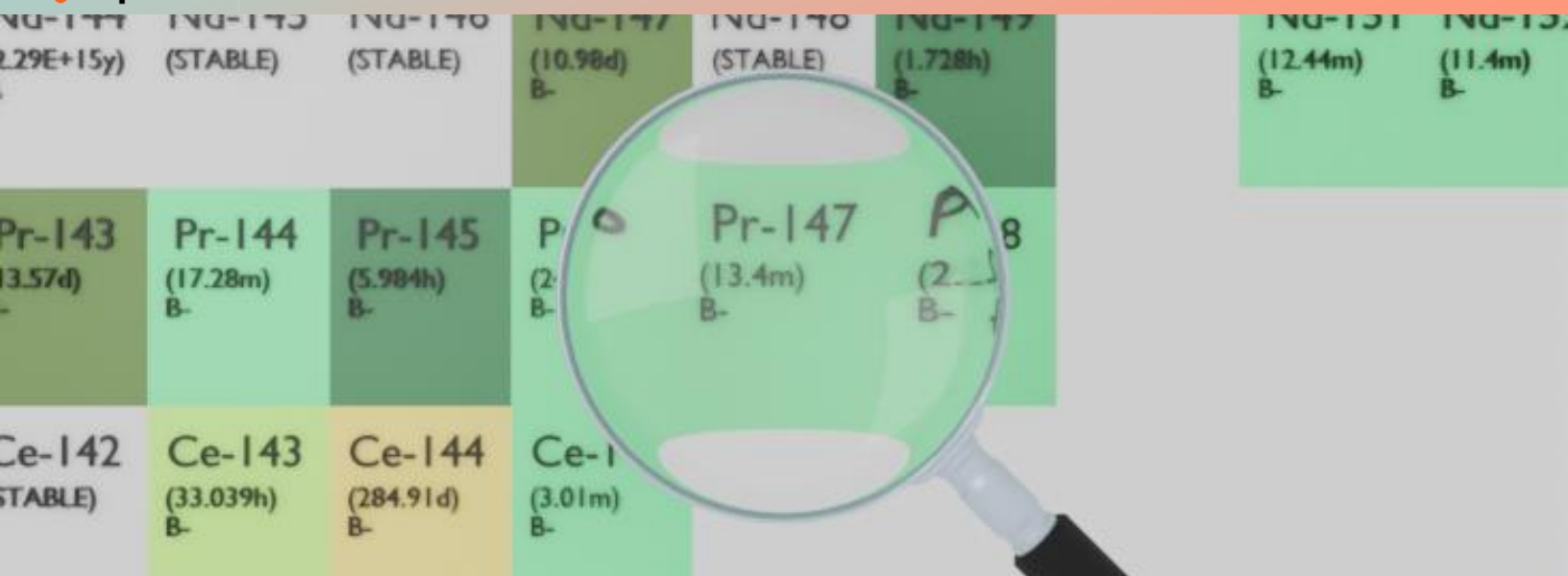




PRASEODYMIUM-147

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pr-147
Atomic number (Z): 59
Mass number (A): 147
Neutron number (N): 88

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 13.4 [m]
Decay constant: $8.6212\text{e-}04$ [1/s]
Daughters: Nd-147 (100.0%)
Radioactive daughters: Nd-147

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.88963 [MeV]
Mean photon energy: 0.48872 [MeV]
Air kerma rate constant, Γ_{10} : $1.967\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $1.967\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $1.425\text{e-}13$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

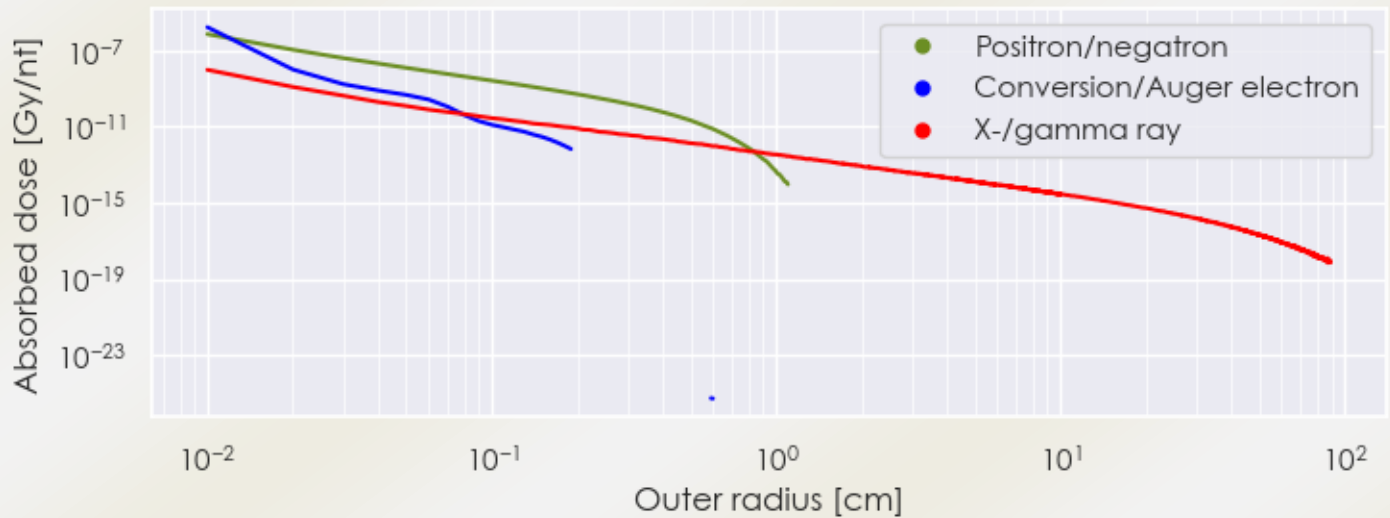
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 1.425×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 7.830×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

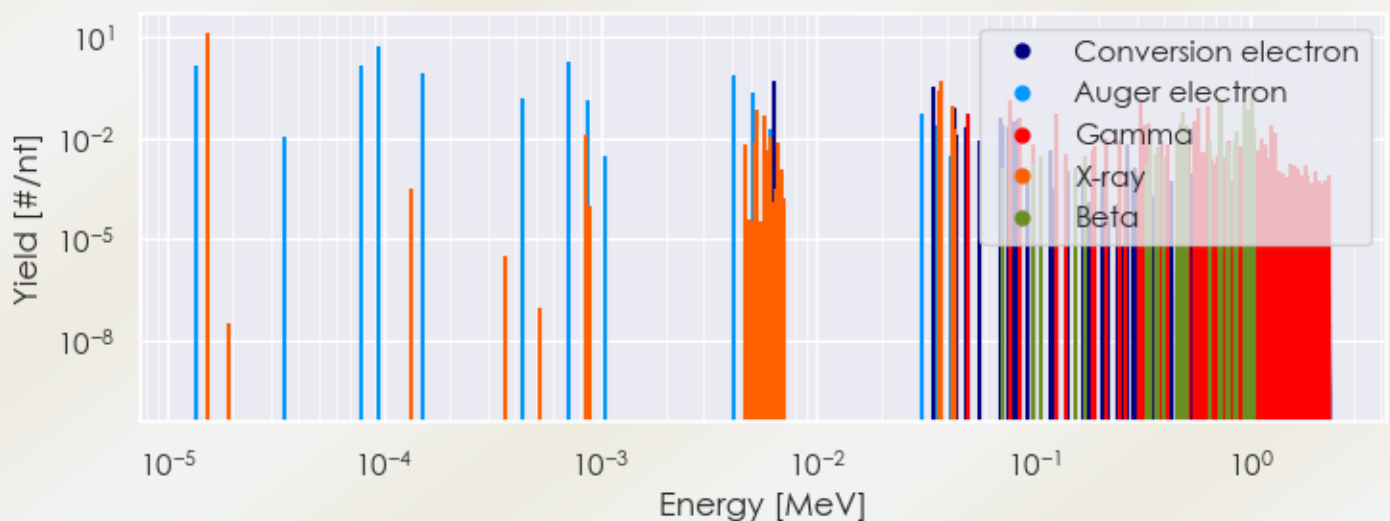
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Pr-147 DPK.csv

SUMMARY SPECTRA (PLOT)

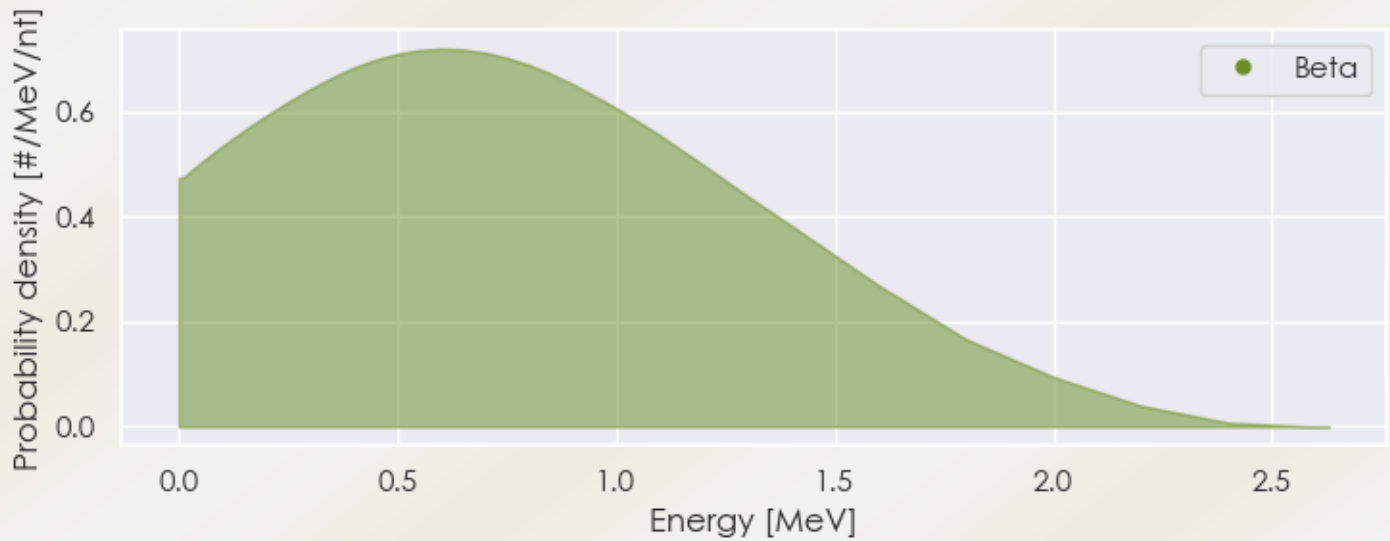
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Pr-147 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/Pr-147 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/Pr-147 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.52010e-05	1.401e+01	X-ray
8.63504e-04	1.247e-02	X-ray
5.21638e-03	6.890e-02	X-ray
5.72010e-03	4.477e-02	X-ray
6.07608e-03	1.136e-02	X-ray
3.68696e-02	2.656e-01	X-ray
3.73962e-02	4.837e-01	X-ray
4.22041e-02	4.778e-02	X-ray
4.23100e-02	9.246e-02	X-ray
4.33442e-02	1.026e-02	X-ray

4.33673e-02	1.994e-02	X-ray
4.99000e-02	5.586e-02	Gamma
7.79900e-02	1.425e-01	Gamma
8.66800e-02	4.332e-02	Gamma
1.27780e-01	5.700e-02	Gamma
3.14680e-01	1.254e-01	Gamma
3.28990e-01	2.451e-02	Gamma
3.35850e-01	2.964e-02	Gamma
4.77740e-01	2.850e-02	Gamma
5.54610e-01	3.363e-02	Gamma
5.77910e-01	8.037e-02	Gamma
6.41480e-01	9.462e-02	Gamma
1.26111e+00	2.622e-02	Gamma
1.30042e+00	1.539e-02	Gamma
3.43722e-01	1.211e-02	Beta
4.77635e-01	2.015e-02	Beta
4.94478e-01	5.952e-02	Beta
5.14303e-01	2.381e-02	Beta
7.19620e-01	1.420e-01	Beta
7.30125e-01	1.357e-01	Beta
8.66402e-01	1.556e-02	Beta
9.33545e-01	1.128e-01	Beta
9.78950e-01	7.310e-02	Beta
1.01831e+00	3.237e-01	Beta
1.04062e+00	2.088e-02	Beta
1.36628e-05	1.401e+00	Auger electron
3.48800e-05	1.128e-02	Auger electron
7.80229e-05	1.430e+00	Auger electron
9.40042e-05	5.306e+00	Auger electron
1.51707e-04	8.115e-01	Auger electron
4.35585e-04	1.571e-01	Auger electron
7.10571e-04	1.890e+00	Auger electron
8.73014e-04	1.297e-01	Auger electron
4.14449e-03	7.160e-01	Auger electron
5.09473e-03	2.406e-01	Auger electron
6.07806e-03	1.998e-02	Auger electron
6.30300e-03	5.127e-01	Conversion electron
3.03768e-02	5.111e-02	Auger electron

3.43930e-02	3.560e-01	Conversion electron
3.58432e-02	2.452e-02	Auger electron
4.28067e-02	6.537e-02	Conversion electron
4.30830e-02	7.714e-02	Conversion electron
4.31726e-02	1.494e-02	Conversion electron
4.36993e-02	1.301e-02	Conversion electron
4.86129e-02	2.029e-02	Conversion electron
7.08967e-02	4.342e-02	Conversion electron
7.12626e-02	2.554e-02	Conversion electron
7.17893e-02	2.613e-02	Conversion electron
7.67029e-02	2.110e-02	Conversion electron
7.99526e-02	2.763e-02	Conversion electron
8.04793e-02	3.059e-02	Conversion electron
8.41830e-02	3.506e-02	Conversion electron
8.53929e-02	1.488e-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