



PRASEODYMIUM-135

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pr-135
Atomic number (Z): 59
Mass number (A): 135
Neutron number (N): 76

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 24.0 [m]
Decay constant: 4.8135e-04 [1/s]
Daughters: Ce-135 (100.0%)
Radioactive daughters: Ce-135

DOSIMETRIC CONSTANTS

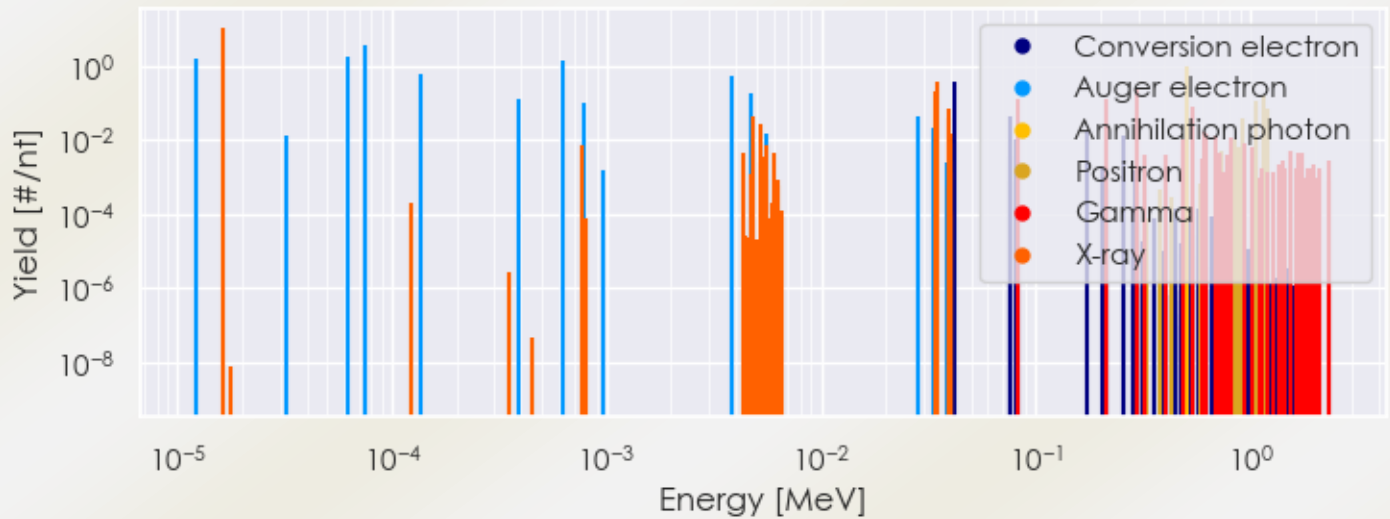
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.57931 [MeV]
Mean photon energy: 0.87411 [MeV]
Air kerma rate constant, Γ_{10} : 1.513e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 3.438e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 9.282e-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, $\Delta_{\beta, \beta^+, e^-}$: 9.282×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.400×10^{-13} [Gy·kg/Bq·s]

SUMMARY SPECTRA (PLOT)

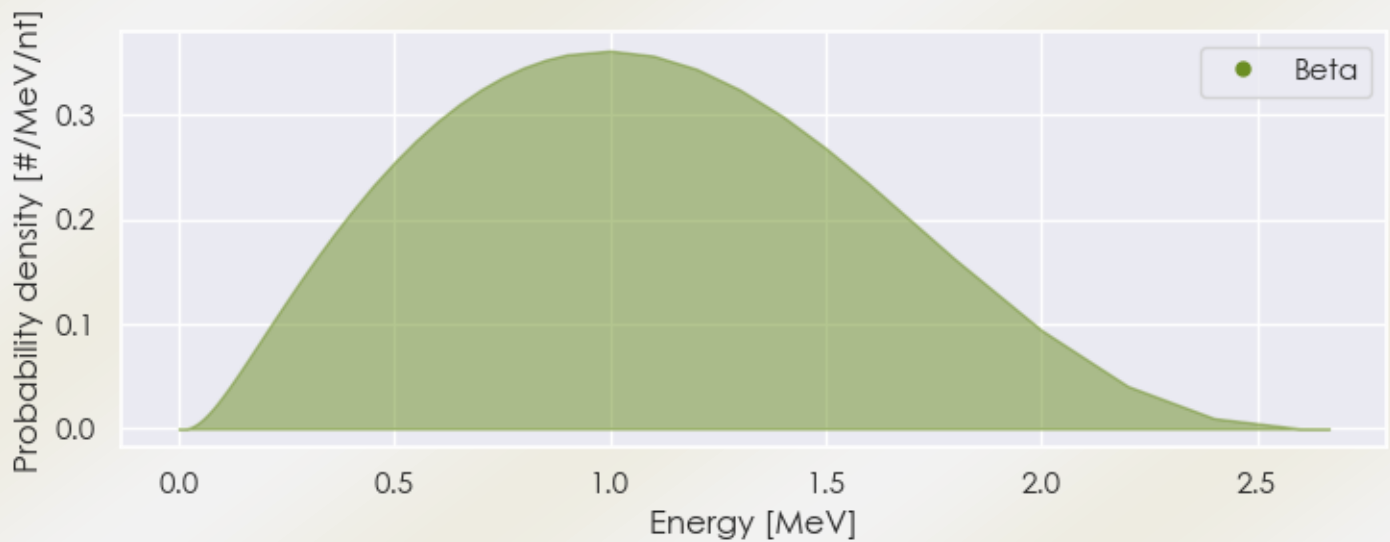
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Pr-135 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-135 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-135 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Pr-135%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# /nt] if > 0.01	Radiation type
1.61263e-05	1.128e+01	X-ray
4.82666e-03	4.524e-02	X-ray
5.25981e-03	2.733e-02	X-ray
3.42907e-02	2.145e-01	X-ray
3.47432e-02	3.928e-01	X-ray
3.91962e-02	3.818e-02	X-ray
3.92855e-02	7.398e-02	X-ray
4.02466e-02	1.582e-02	X-ray
8.26400e-02	1.365e-01	Gamma
2.13450e-01	1.300e-01	Gamma
2.96120e-01	2.405e-01	Gamma
2.96120e-01	3.250e-02	Gamma
4.84300e-01	1.040e-02	Gamma
5.11000e-01	9.945e-01	Annihilation photon
5.38200e-01	8.060e-02	Gamma
6.13800e-01	1.781e-02	Gamma
6.20900e-01	1.560e-02	Gamma
6.97500e-01	1.365e-02	Gamma
6.97500e-01	1.365e-02	Gamma
8.06900e-01	1.170e-02	Gamma
8.49052e-01	1.103e-02	Positron
9.21222e-01	4.012e-02	Positron
1.06925e+00	1.203e-01	Positron
1.06926e+00	7.722e-02	Positron
1.16715e+00	1.605e-01	Positron
1.20519e+00	7.020e-02	Positron
1.22653e-05	1.604e+00	Auger electron
3.21300e-05	1.313e-02	Auger electron

6.25317e-05	1.742e+00	Auger electron
7.40144e-05	3.790e+00	Auger electron
1.35150e-04	5.911e-01	Auger electron
3.88045e-04	1.253e-01	Auger electron
6.26758e-04	1.394e+00	Auger electron
7.79278e-04	1.010e-01	Auger electron
3.85025e-03	5.387e-01	Auger electron
4.70673e-03	1.774e-01	Auger electron
5.59557e-03	1.432e-02	Auger electron
2.83188e-02	4.638e-02	Auger electron
3.33488e-02	2.186e-02	Auger electron
4.21840e-02	3.603e-01	Conversion electron
7.61267e-02	4.527e-02	Conversion electron
8.14695e-02	1.039e-02	Conversion electron
1.72994e-01	1.622e-02	Conversion electron
2.55664e-01	1.255e-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