



GADOLINIUM-145M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Gd-145m
Atomic number (Z): 64
Mass number (A): 145
Neutron number (N): 81

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture, Internal transition
Half-life: 85.0 [s]
Decay constant: 8.1547×10^{-3} [1/s]
Daughters: Gd-145 (94.3%), Eu-145 (5.7%)
Radioactive daughters: Gd-145, Eu-145

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.1927 [MeV]
Mean photon energy: 0.68138 [MeV]
Air kerma rate constant, Γ_{10} : 2.408×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 2.578×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 3.087×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

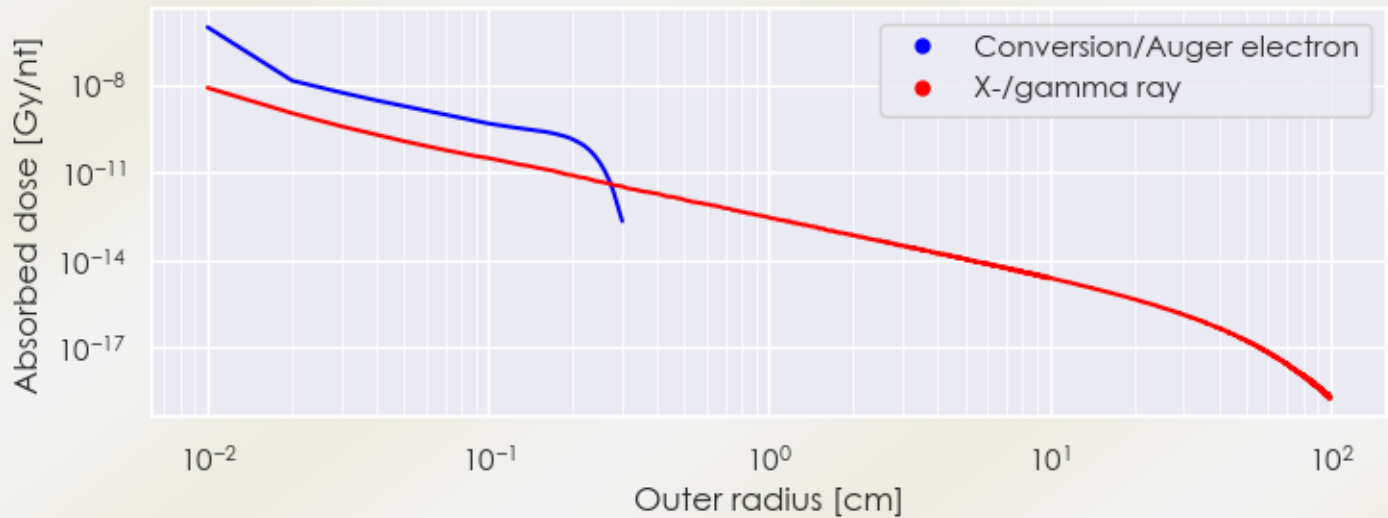
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e^-}$: 3.087×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.092×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

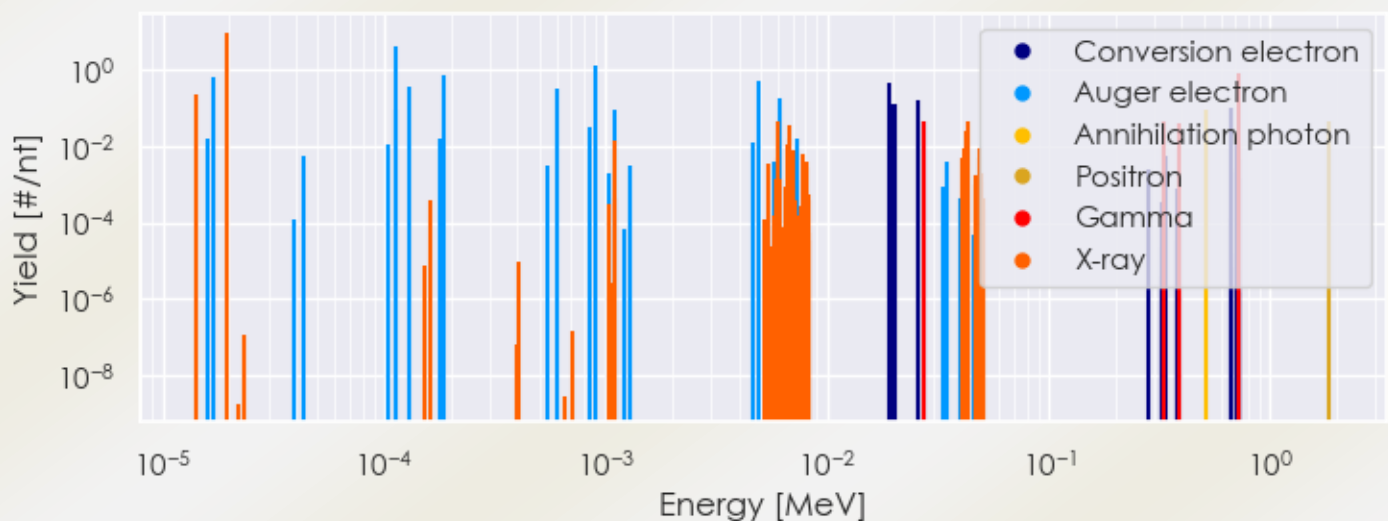
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Gd-145m DPK.csv

SUMMARY SPECTRA (PLOT)

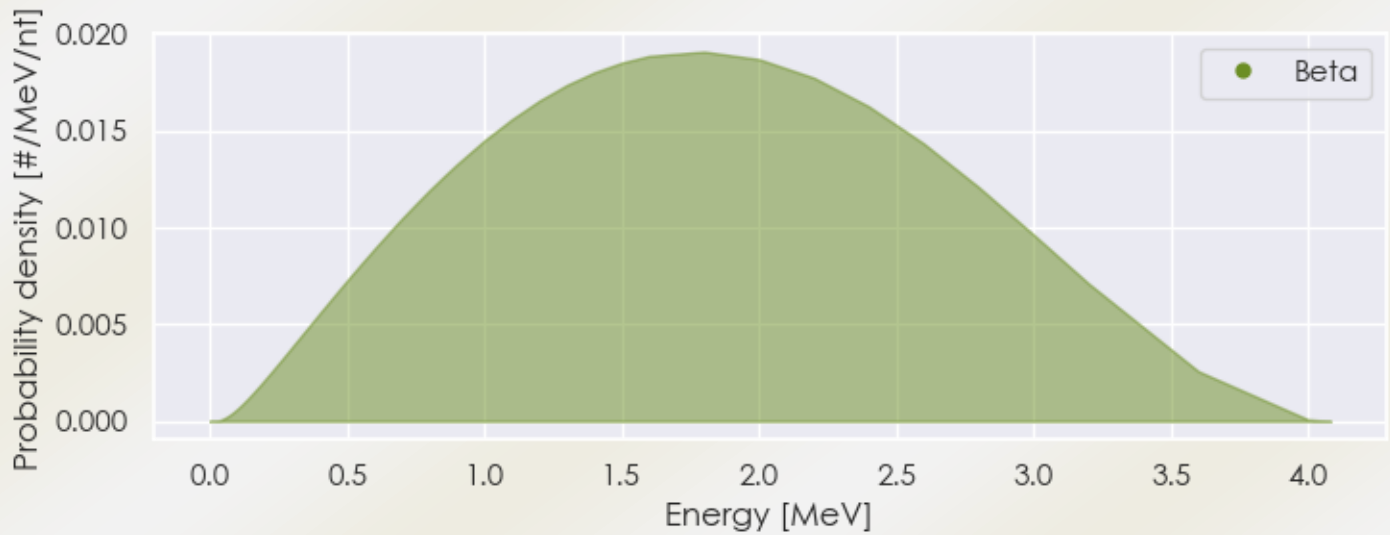
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Gd-145m 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/Gd-145m 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/Gd-145m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.42271e-05	2.146e-01	X-ray
1.94681e-05	9.486e+00	X-ray
1.10136e-03	1.327e-02	X-ray
6.04290e-03	4.402e-02	X-ray
6.66291e-03	1.129e-02	X-ray
6.71540e-03	3.684e-02	X-ray
6.80799e-03	1.611e-02	X-ray
2.73000e-02	4.420e-02	Gamma
4.23559e-02	2.574e-02	X-ray

4.30603e-02	4.628e-02	X-ray
3.29500e-01	4.287e-02	Gamma
3.86600e-01	3.933e-02	Gamma
5.11000e-01	8.800e-02	Annihilation photon
7.16000e-01	1.101e-02	Gamma
7.21400e-01	8.208e-01	Gamma
1.86168e+00	4.400e-02	Positron
1.58398e-05	1.519e-02	Auger electron
1.68638e-05	6.606e-01	Auger electron
1.05126e-04	1.040e-02	Auger electron
1.13019e-04	9.256e-02	Auger electron
1.13111e-04	4.283e+00	Auger electron
1.28518e-04	3.584e-01	Auger electron
1.79241e-04	1.470e-02	Auger electron
1.84308e-04	7.437e-01	Auger electron
6.03789e-04	3.034e-01	Auger electron
8.53948e-04	3.165e-02	Auger electron
9.03524e-04	1.309e+00	Auger electron
1.08915e-03	9.031e-02	Auger electron
4.61867e-03	1.168e-02	Auger electron
4.91945e-03	4.760e-01	Auger electron
6.09143e-03	1.683e-01	Auger electron
7.30652e-03	1.482e-02	Auger electron
1.89502e-02	4.530e-01	Conversion electron
1.93530e-02	1.256e-01	Conversion electron
2.00573e-02	1.205e-01	Conversion electron
2.57582e-02	1.560e-01	Conversion electron
2.73000e-02	4.314e-02	Conversion electron
6.71097e-01	9.598e-02	Conversion electron
7.13050e-01	1.547e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6