



DYSPROSIUM-150

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Dy-150
Atomic number (Z): 66
Mass number (A): 150
Neutron number (N): 84

RADIOACTIVE DECAY

Decay modes: α , β^+ , Electron capture
Half-life: 7.17 [m]
Decay constant: $1.6112\text{e-}03$ [1/s]
Daughters: Tb-150 (64.0%), Gd-146 (36.0%)
Radioactive daughters: Tb-150, Gd-146

DOSIMETRIC CONSTANTS

Mean alpha energy: 1.5663 [MeV]
Mean electron energy: 0.007 [MeV]
Mean photon energy: 0.27847 [MeV]
Air kerma rate constant, Γ_{10} : $1.104\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $1.106\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $2.521\text{e-}13$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $2.509\text{e-}13$ [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 1.122×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.462×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

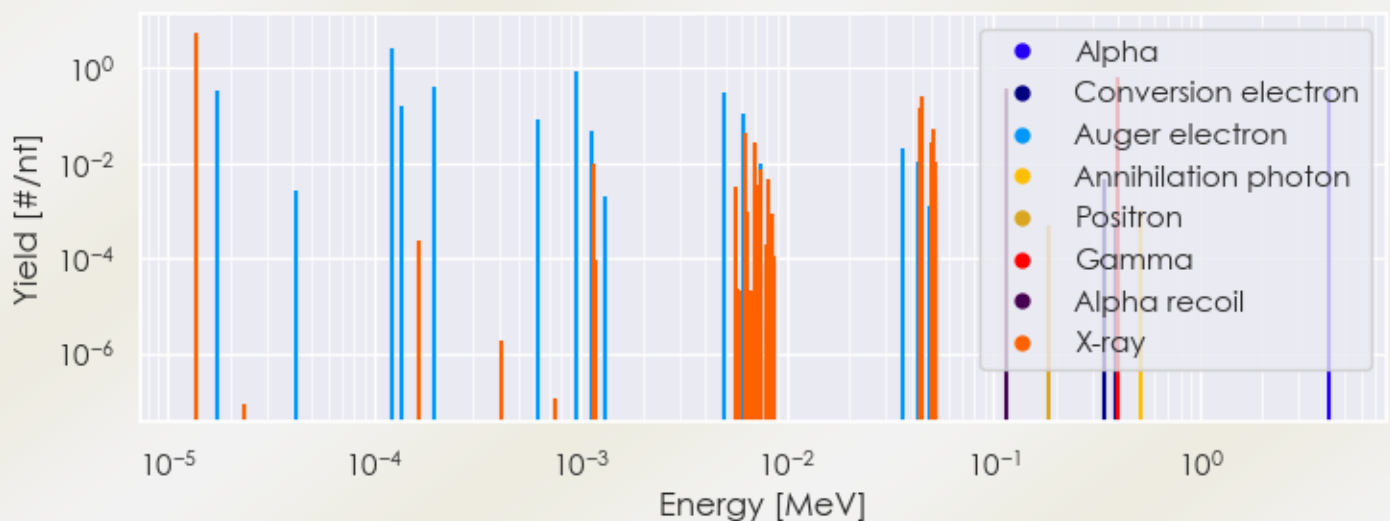
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Dy-150 DPK.csv

SUMMARY SPECTRA (PLOT)

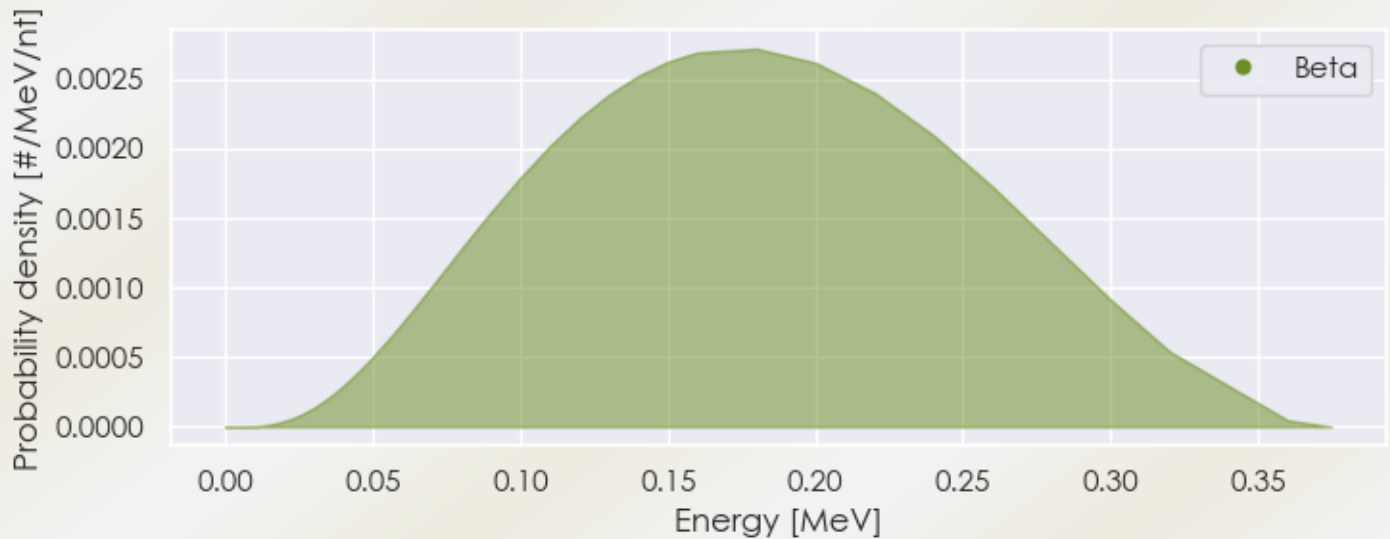
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Dy-150 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/Dy-150 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/Dy-150 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.38228e-05	5.695e+00	X-ray
6.26069e-03	4.261e-02	X-ray
6.98190e-03	2.788e-02	X-ray
4.37992e-02	1.447e-01	X-ray
4.45546e-02	2.593e-01	X-ray
5.03066e-02	2.653e-02	X-ray
5.04632e-02	5.131e-02	X-ray
5.17791e-02	1.128e-02	X-ray
3.97200e-01	6.400e-01	Gamma
1.73725e-05	3.392e-01	Auger electron

1.22009e-04	2.602e+00	Auger electron
1.35523e-04	1.602e-01	Auger electron
1.97292e-04	4.123e-01	Auger electron
6.19945e-04	8.326e-02	Auger electron
9.60929e-04	8.816e-01	Auger electron
1.13634e-03	5.012e-02	Auger electron
4.95178e-03	3.187e-01	Auger electron
6.15962e-03	1.114e-01	Auger electron
3.58945e-02	2.154e-02	Auger electron
4.25487e-02	1.071e-02	Auger electron
4.23500e+00	3.600e-01	Alpha
1.16103e-01	3.600e-01	Alpha recoil

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