



Ho-150 (6.8s) EC ⁺	Ho-151 (3.73m) ECB+A	Ho-152 (19.5m) EC	Ho-153 (36m) ECB ⁺
Dy-149 (4.20m) EC ⁺	Dy-150 (7.17m) ECB+A	Dy-151 (17.9m) ECB+A	Dy-152 (2.38h) ECA
Dy-153 (3.0E- A	Dy-154 (11.76m) ECB+A	Dy-155 (9.9h) ECB ⁺	Dy-156 (STABLE)
Dy-157 (8.14h) EC			

HOLMIUM-154

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ho-154
Atomic number (Z): 67
Mass number (A): 154
Neutron number (N): 87

RADIOACTIVE DECAY

Decay modes: α , β^+ , Electron capture
Half-life: 11.76 [m]
Decay constant: 9.8235×10^{-4} [1/s]
Daughters: Dy-154 (100.0%), Tb-150 (0.019%)
Radioactive daughters: Dy-154, Tb-150

DOSIMETRIC CONSTANTS

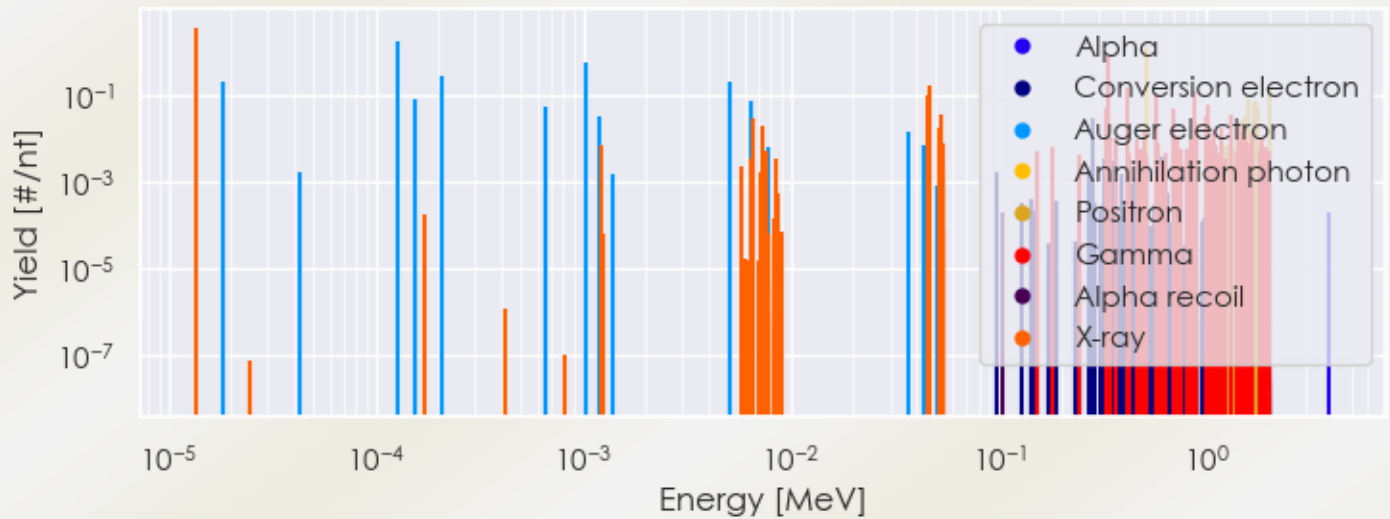
Mean alpha energy: 0.0007 [MeV]
Mean electron energy: 1.09266 [MeV]
Mean photon energy: 1.88173 [MeV]
Air kerma rate constant, Γ_{10} : 4.417×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 6.890×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.752×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 1.122×10^{-16} [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta+,e-}$: 1.751e-13 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.015e-13 [Gy·kg/Bq·s]

SUMMARY SPECTRA (PLOT)

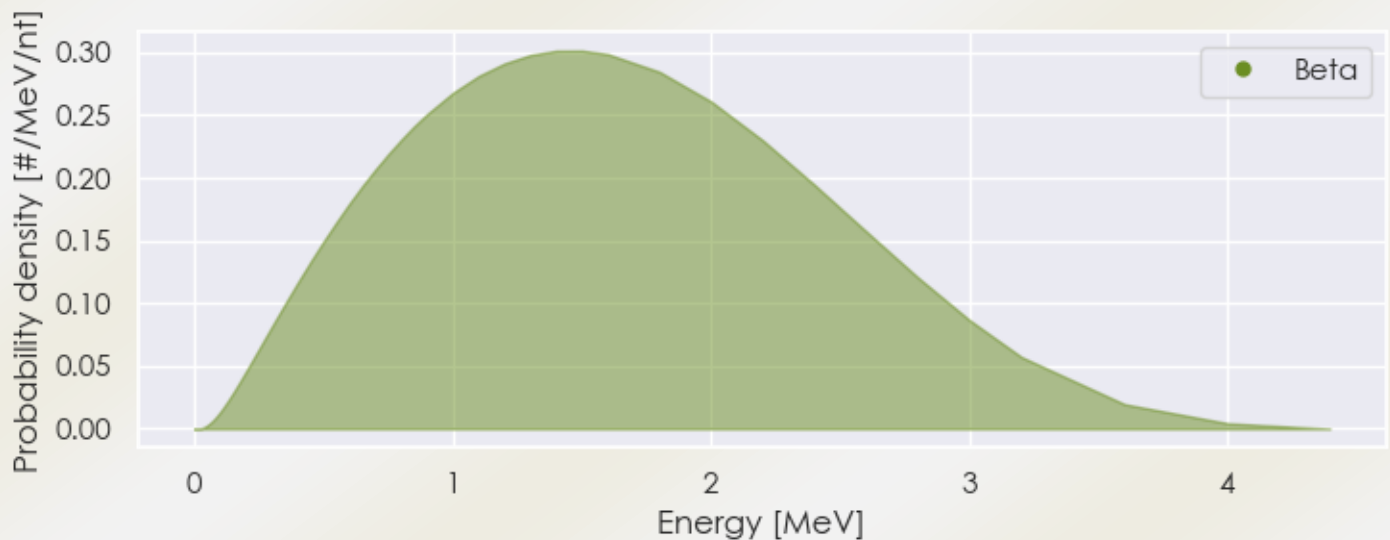
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: [www.mirdsoft.org/products/MIRDspecs/Ho-154 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Ho-154%20Summary%20Spectrum.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/Ho-154 Beta Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Ho-154%20Beta%20Spectrum.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/Ho-154 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Ho-154%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [#/(nt)] if > 0.01	Radiation type
1.37110e-05	3.726e+00	X-ray
6.48150e-03	3.024e-02	X-ray
7.25411e-03	2.027e-02	X-ray
4.52703e-02	9.770e-02	X-ray
4.60801e-02	1.746e-01	X-ray
5.20302e-02	1.797e-02	X-ray
5.21989e-02	3.474e-02	X-ray
3.26200e-01	4.725e-02	Gamma
3.34600e-01	8.438e-01	Gamma
3.46600e-01	1.004e-02	Gamma
3.66200e-01	1.072e-02	Gamma
4.12500e-01	1.502e-01	Gamma
5.04900e-01	1.502e-02	Gamma
5.11000e-01	1.278e+00	Annihilation photon
5.69000e-01	1.114e-01	Gamma
5.70000e-01	1.114e-01	Gamma
6.92500e-01	5.147e-02	Gamma
6.95500e-01	1.080e-02	Gamma
7.29700e-01	1.232e-02	Gamma
8.73400e-01	1.249e-01	Gamma
9.05200e-01	2.194e-02	Gamma
9.99700e-01	3.257e-02	Gamma
1.02710e+00	5.738e-02	Gamma
1.08590e+00	1.637e-02	Gamma
1.17320e+00	1.781e-02	Gamma
1.30060e+00	3.780e-02	Gamma
1.42030e+00	2.034e-02	Gamma
1.49830e+00	1.418e-02	Gamma

1.51030e+00	1.865e-02	Gamma
1.65650e+00	1.392e-02	Gamma
1.83410e+00	1.004e-02	Gamma
1.40113e+00	2.257e-02	Positron
1.45986e+00	2.472e-02	Positron
1.47618e+00	1.397e-02	Positron
1.50012e+00	2.580e-02	Positron
1.51401e+00	3.225e-02	Positron
1.56149e+00	1.827e-02	Positron
1.59833e+00	8.599e-02	Positron
1.64842e+00	1.612e-02	Positron
1.68225e+00	6.986e-02	Positron
1.73894e+00	7.739e-02	Positron
1.78853e+00	5.589e-02	Positron
2.00546e+00	1.301e-01	Positron
1.81686e-05	2.062e-01	Auger electron
1.28562e-04	1.701e+00	Auger electron
1.55269e-04	8.357e-02	Auger electron
2.09648e-04	2.737e-01	Auger electron
6.58474e-04	5.448e-02	Auger electron
1.01692e-03	5.924e-01	Auger electron
1.19262e-03	3.222e-02	Auger electron
5.12117e-03	2.119e-01	Auger electron
6.38380e-03	7.457e-02	Auger electron
3.70640e-02	1.390e-02	Auger electron
2.80739e-01	3.000e-02	Conversion electron
3.43439e-01	1.027e-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