



ERBIUM-163

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Er-163
Atomic number (Z): 68
Mass number (A): 163
Neutron number (N): 95

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 75.0 [m]
Decay constant: 1.5403×10^{-4} [1/s]
Daughters: Ho-163 (100.0%)
Radioactive daughters: Ho-163

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.00808 [MeV]
Mean photon energy: 0.04032 [MeV]
Air kerma rate constant, Γ_{10} : 2.136×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 2.137×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.295×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

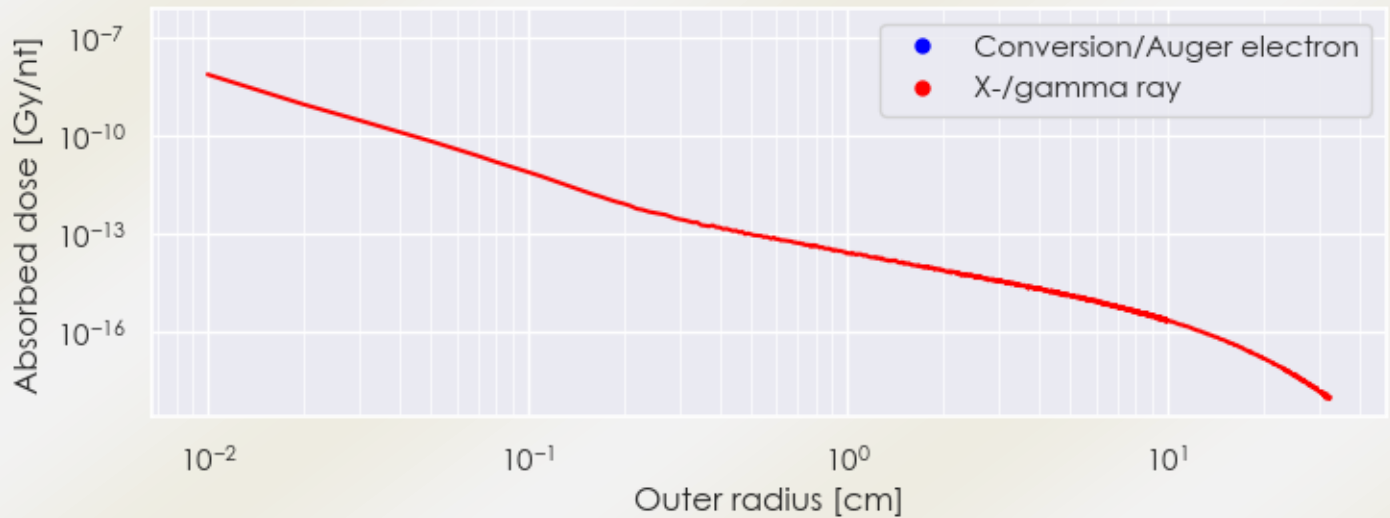
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.295×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 6.460×10^{-15} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

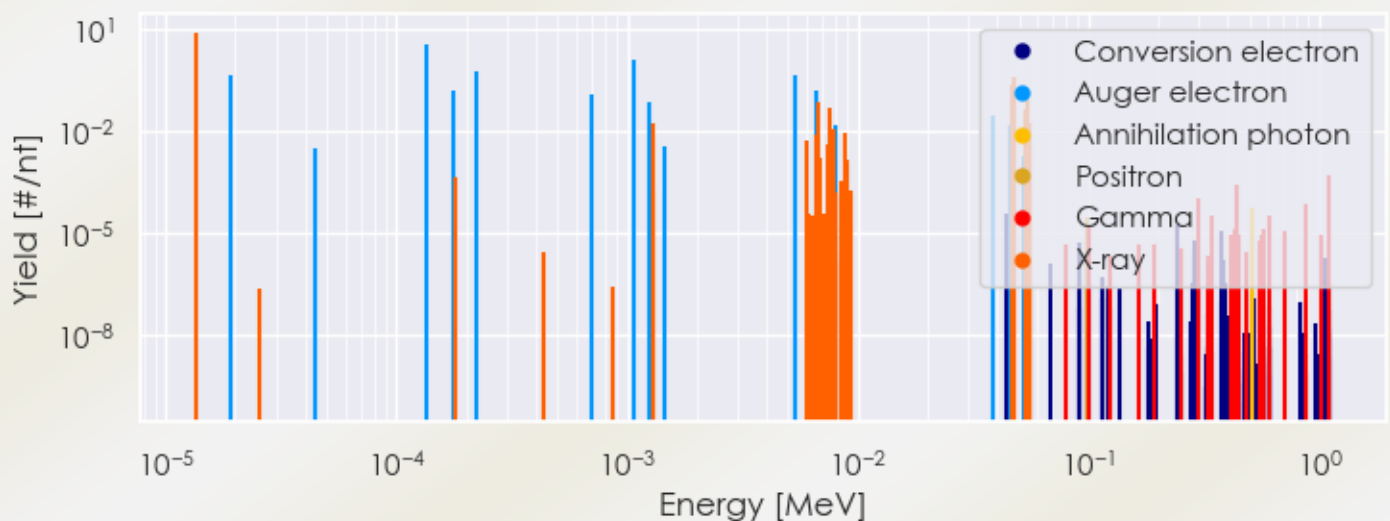
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Er-163 DPK.csv

SUMMARY SPECTRA (PLOT)

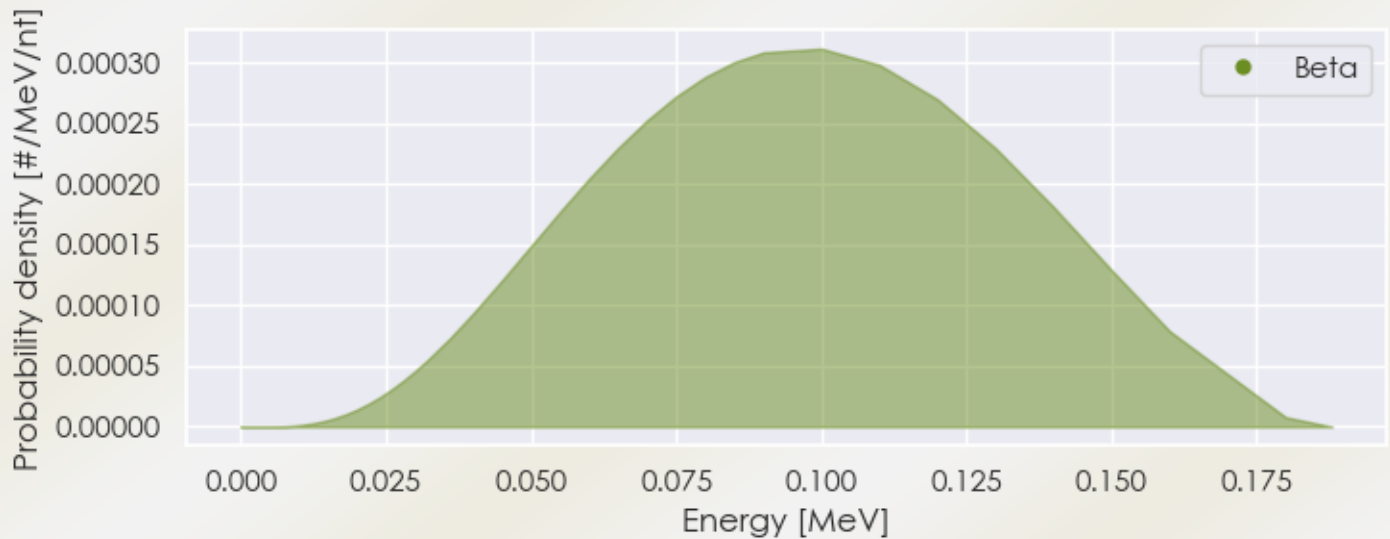
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Er-163 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/Er-163 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/Er-163 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.36217e-05	8.305e+00	X-ray
1.29866e-03	1.769e-02	X-ray
6.70641e-03	7.218e-02	X-ray
7.53351e-03	4.843e-02	X-ray
7.89548e-03	1.224e-02	X-ray
4.67702e-02	2.239e-01	X-ray
4.76373e-02	3.988e-01	X-ray
5.37885e-02	4.130e-02	X-ray
5.39705e-02	7.984e-02	X-ray
5.53966e-02	1.766e-02	X-ray

1.89749e-05	4.308e-01	Auger electron
1.34836e-04	3.777e+00	Auger electron
1.78022e-04	1.543e-01	Auger electron
2.21787e-04	6.224e-01	Auger electron
7.04755e-04	1.293e-01	Auger electron
1.07453e-03	1.346e+00	Auger electron
1.25076e-03	7.003e-02	Auger electron
5.29924e-03	4.765e-01	Auger electron
6.61859e-03	1.688e-01	Auger electron
7.97146e-03	1.508e-02	Auger electron
3.82545e-02	3.094e-02	Auger electron
4.54244e-02	1.557e-02	Auger 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