



IODINE-124

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: I-124
Atomic number (Z): 53
Mass number (A): 124
Neutron number (N): 71

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 4.176 [d]
Decay constant: 1.9211×10^{-6} [1/s]
Daughters: Te-124 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.19428 [MeV]
Mean photon energy: 1.11324 [MeV]
Air kerma rate constant, Γ_{10} : 3.399×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 4.284×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 3.113×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

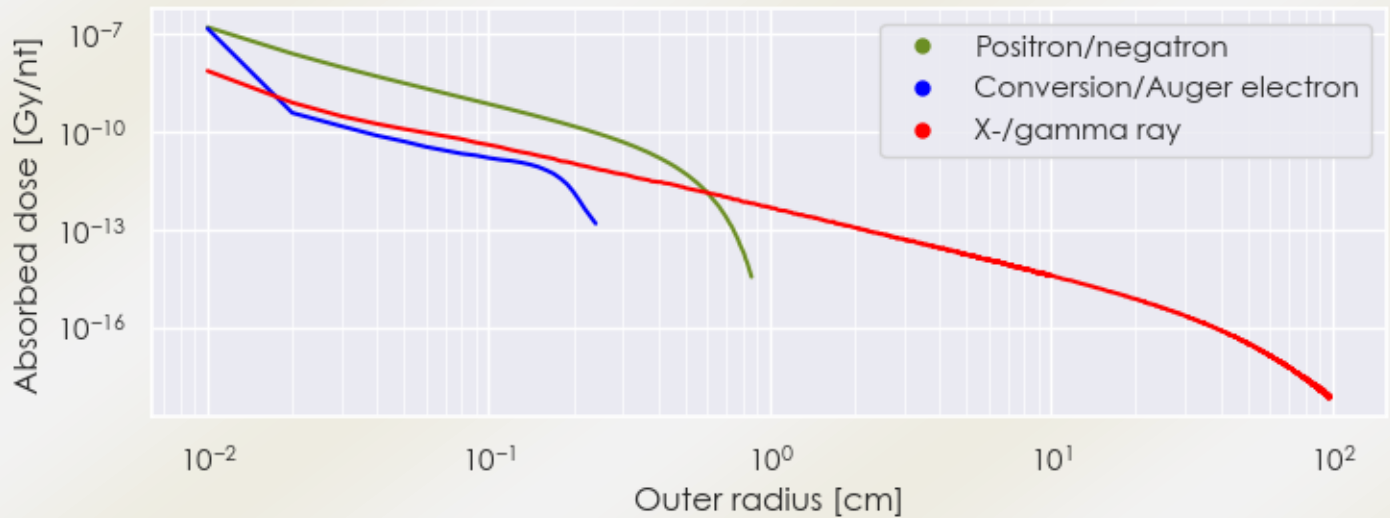
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 3.113×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.784×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

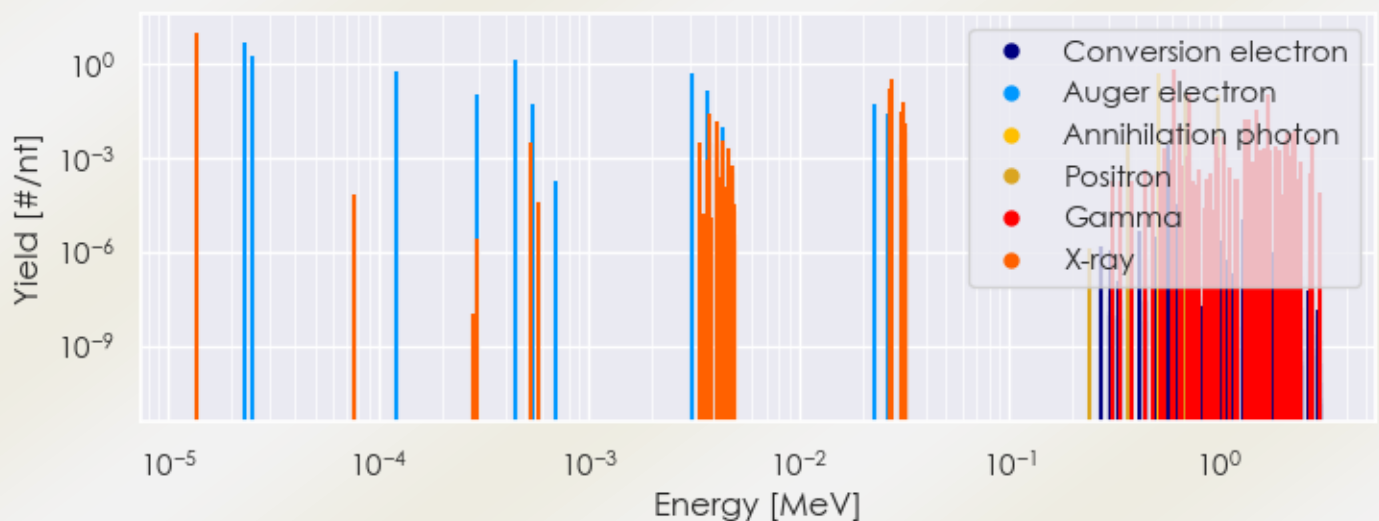
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/I-124 DPK.csv

SUMMARY SPECTRA (PLOT)

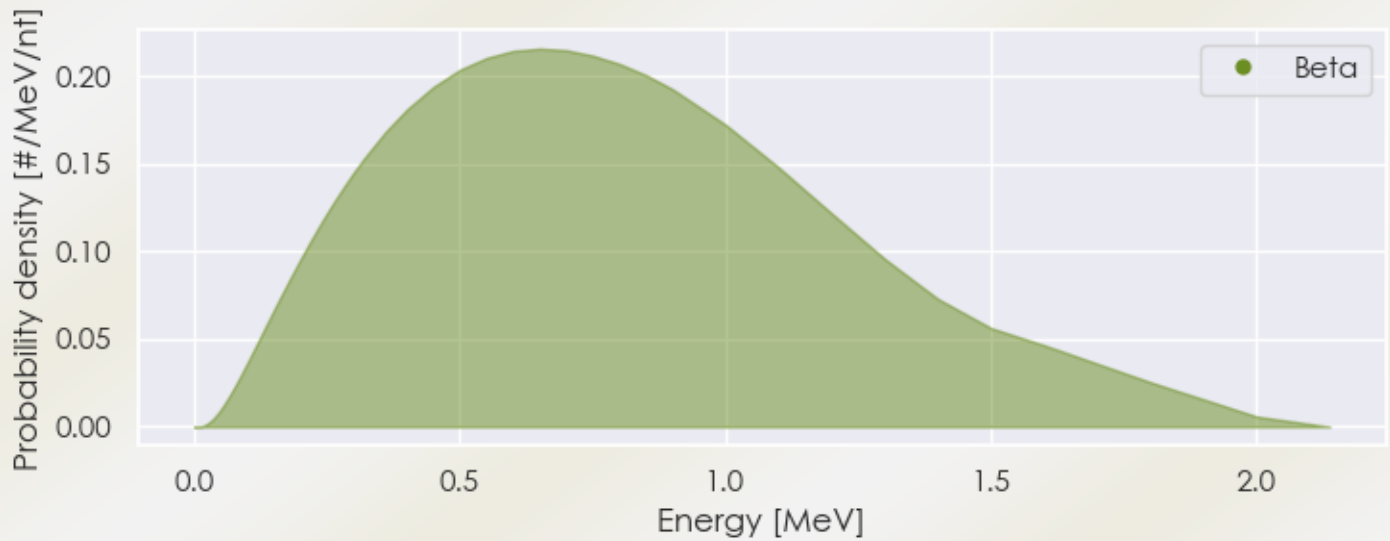
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/I-124 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/I-124 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/I-124 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.36107e-05	9.946e+00	X-ray
3.75695e-03	2.622e-02	X-ray
4.02446e-03	1.506e-02	X-ray
2.71868e-02	1.668e-01	X-ray
2.74652e-02	3.105e-01	X-ray
3.09378e-02	2.859e-02	X-ray
3.09901e-02	5.545e-02	X-ray
3.16841e-02	1.164e-02	X-ray
5.11000e-01	4.572e-01	Annihilation photon
6.02720e-01	6.290e-01	Gamma

7.22780e-01	1.035e-01	Gamma
1.32550e+00	1.561e-02	Gamma
1.37600e+00	1.749e-02	Gamma
1.50949e+00	3.132e-02	Gamma
1.69102e+00	1.088e-01	Gamma
6.87056e-01	1.173e-01	Positron
9.74767e-01	1.083e-01	Positron
2.29241e-05	4.860e+00	Auger electron
2.49253e-05	1.624e+00	Auger electron
1.21001e-04	5.595e-01	Auger electron
2.96188e-04	1.045e-01	Auger electron
4.49512e-04	1.250e+00	Auger electron
5.41245e-04	4.817e-02	Auger electron
3.08495e-03	4.908e-01	Auger electron
3.67910e-03	1.390e-01	Auger electron
2.26653e-02	5.391e-02	Auger electron
2.65056e-02	2.374e-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