



Zn-61 (39.1s) CB+	Zn-62 (9.186h) ECB+	Zn-63 (38.47m) ECB+	Zn-64 (STABLE)	Zn-65 (244.06d)	Zn-66 (STABLE)	Zn-67 (STABLE)	Zn-68 (STABLE)	Zn-69 (56.4m) B-
Cu-60 (23.7m) CB+	Cu-61 (3.333h) ECB+	Cu-62 (9.673m) ECB+	Cu-63 (STABLE)	Cu-64 (12.700h) ECB+B-	Cu-65 (STABLE)	Cu-66 (5.120m) B-	Cu-67 (61.83h) B-	
Ni-59 (1.01E+5y) CB+	Ni-60 (STABLE)	Ni-61 (STABLE)	Ni-62 (STABLE)	Ni-63 (STABLE)	Ni-64 (STABLE)	Ni-65 (2.51719h) B-	Ni-66 (54.6h) B-	

COPPER-64

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Cu-64
Atomic number (Z): 29
Mass number (A): 64
Neutron number (N): 35

RADIOACTIVE DECAY

Decay modes: β^- , β^+ , Electron capture
Half-life: 12.7 [h]
Decay constant: 1.5161×10^{-5} [1/s]
Daughters: Ni-64 (61.0%), Zn-64 (39.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.12475 [MeV]
Mean photon energy: 0.18548 [MeV]
Air kerma rate constant, Γ_{10} : 2.135×10^{-19} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 6.953×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.999×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $0.000 \times 10^{+00}$ [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: $1.999\text{e-}14$ [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : $2.972\text{e-}14$ [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

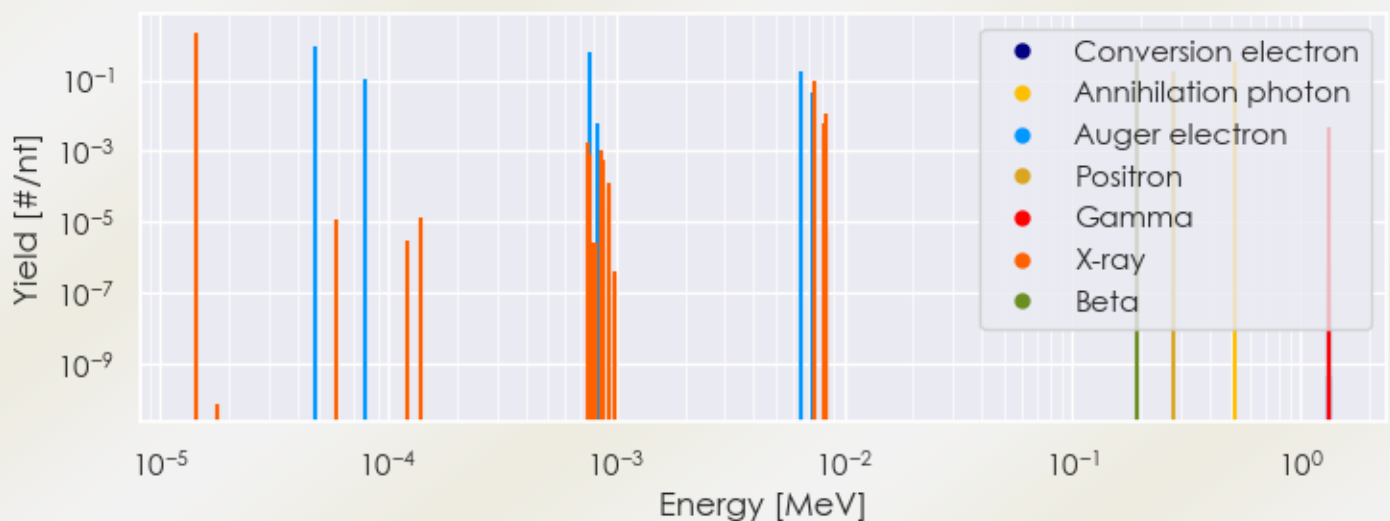
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Cu-64 DPK.csv

SUMMARY SPECTRA (PLOT)

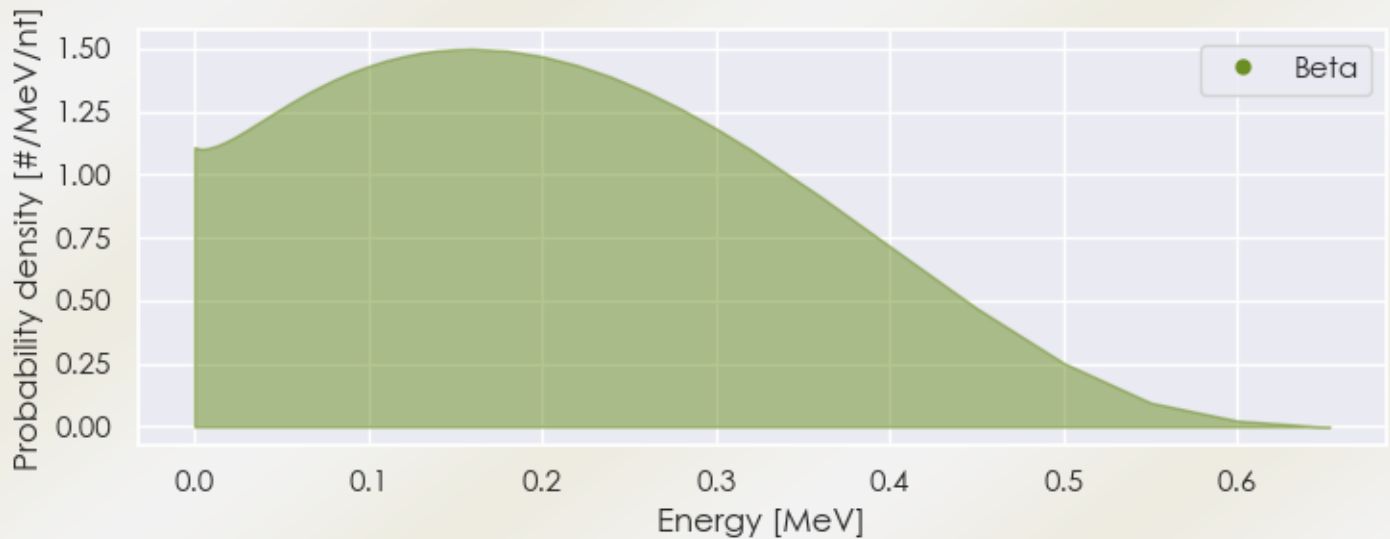
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Cu-64 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/Cu-64 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/Cu-64 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.44988e-05	2.243e+00	X-ray
7.41782e-03	4.677e-02	X-ray
7.43578e-03	9.133e-02	X-ray
8.22459e-03	1.121e-02	X-ray
5.11000e-01	3.482e-01	Annihilation photon
1.90428e-01	3.900e-01	Beta
2.78220e-01	1.741e-01	Positron
4.78726e-05	8.772e-01	Auger electron
7.88419e-05	1.116e-01	Auger electron
7.72710e-04	5.811e-01	Auger electron

6.49788e-03	1.826e-01	Auger electron
7.31362e-03	4.566e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6