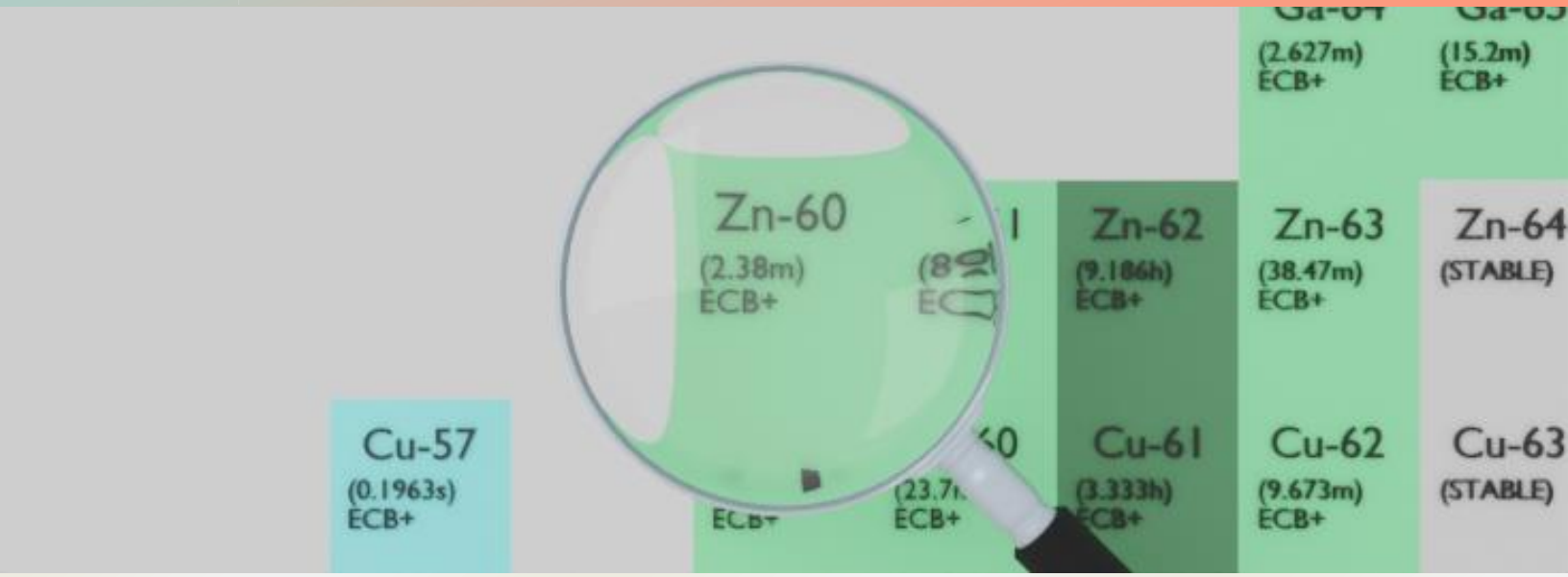


ZINC-60

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Zn-60
Atomic number (Z): 30
Mass number (A): 60
Neutron number (N): 30

RADIOACTIVE DECAY

Decay modes: β+, Electron capture
Half-life: 2.38 [m]
Decay constant: 4.8540e-03 [1/s]
Daughters: Cu-60 (100.0%)
Radioactive daughters: Cu-60

DOSIMETRIC CONSTANTS

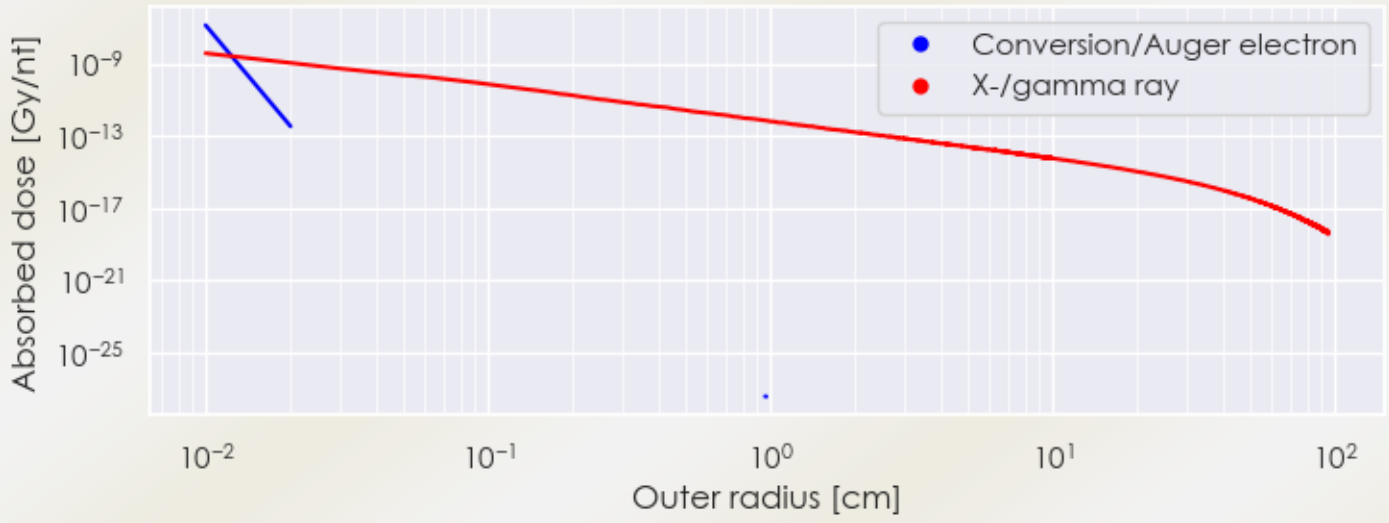
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.13011 [MeV]
Mean photon energy: 1.52824 [MeV]
Air kerma rate constant, Γ_{10}: 2.020e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air}: 5.760e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 1.811e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}: 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 1.811e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 2.449e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

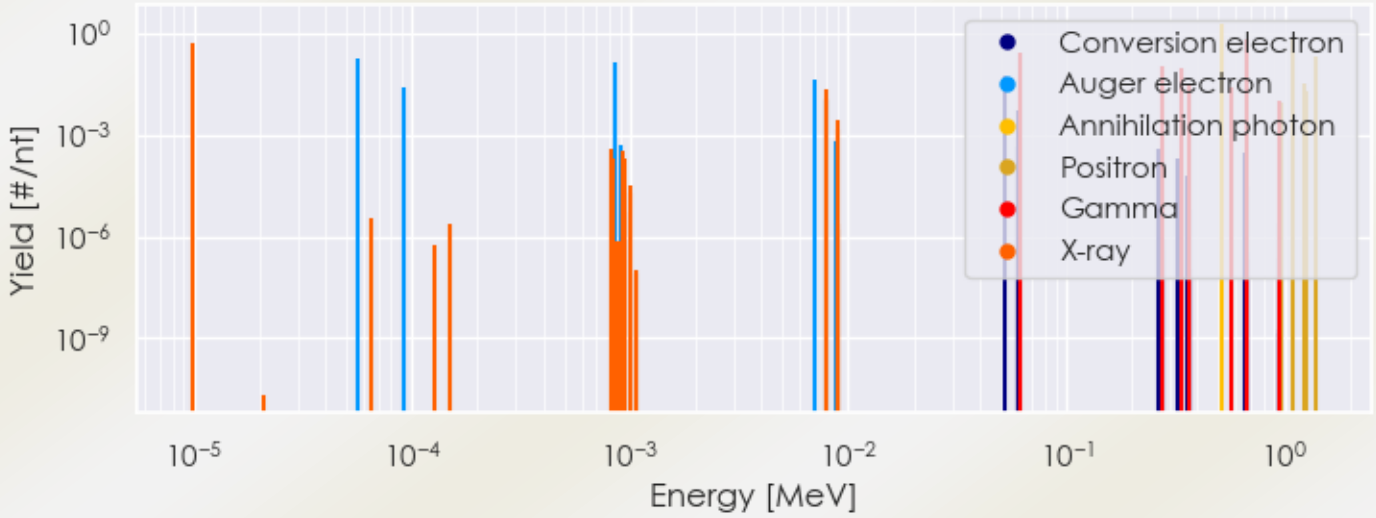
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Zn-60 DPK.csv

SUMMARY SPECTRA (PLOT)

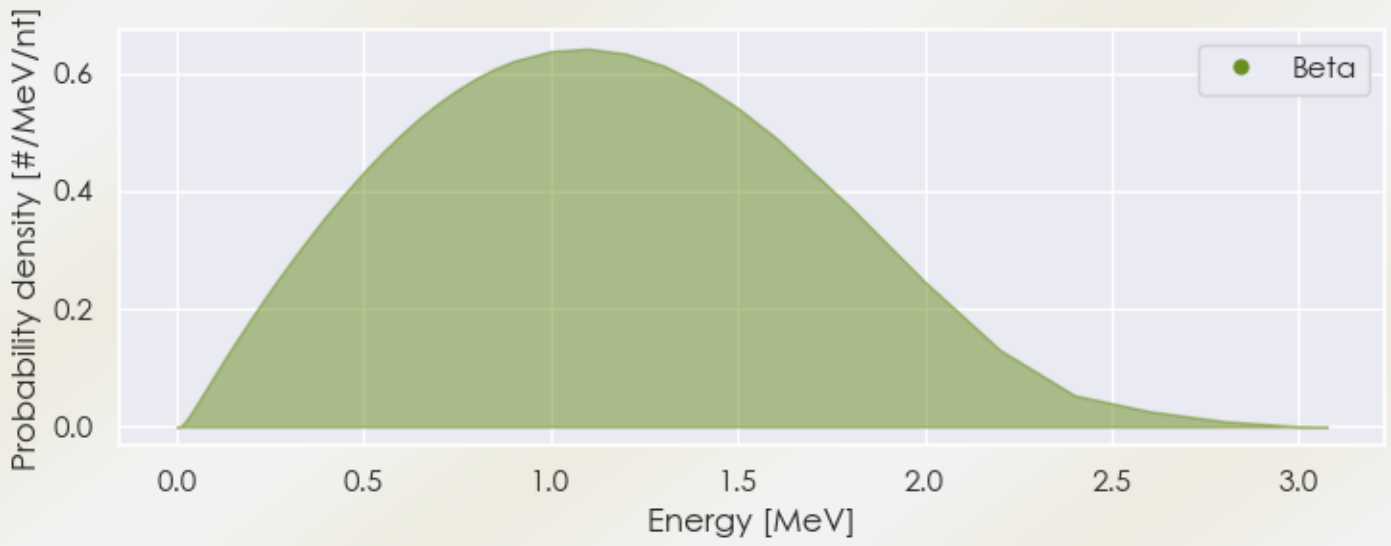
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Zn-60 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/Zn-60 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/Zn-60 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
9.87292e-06	4.821e-01	X-ray
7.98465e-03	1.155e-02	X-ray
8.00569e-03	2.252e-02	X-ray
6.14000e-02	2.560e-01	Gamma
2.73400e-01	1.088e-01	Gamma
3.34400e-01	8.960e-02	Gamma
3.64600e-01	3.200e-02	Gamma
5.11000e-01	1.932e+00	Annihilation photon
5.72400e-01	2.624e-02	Gamma
6.70300e-01	6.400e-01	Gamma

9.47000e-01	1.024e-02	Gamma
1.09912e+00	7.043e-01	Positron
1.24302e+00	3.119e-02	Positron
1.25668e+00	2.012e-02	Positron
1.38598e+00	2.012e-01	Positron
5.69184e-05	1.787e-01	Auger electron
9.09202e-05	2.370e-02	Auger electron
8.55976e-04	1.309e-01	Auger electron
6.99135e-03	3.946e-02	Auger electron
5.24568e-02	5.691e-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