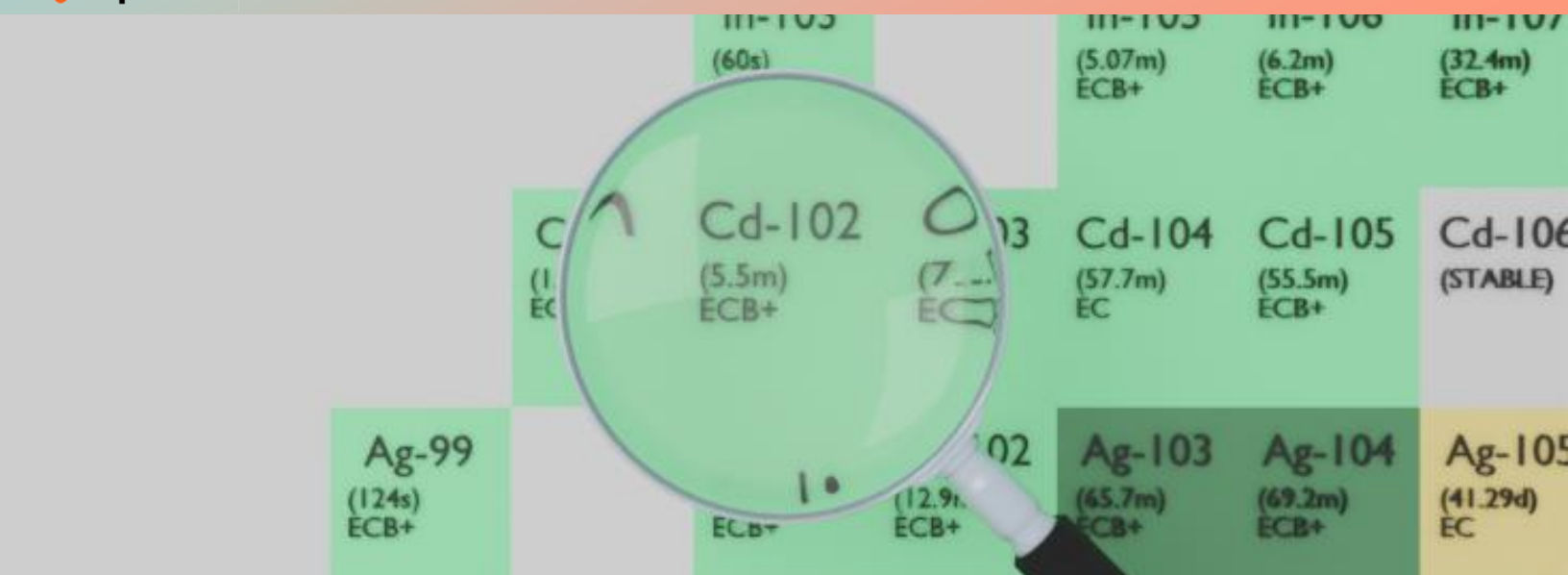




CADMIUM-102

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Cd-102
Atomic number (Z): 48
Mass number (A): 102
Neutron number (N): 54

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 5.5 [m]
Decay constant: 2.1004×10^{-3} [1/s]
Daughters: Ag-102m (94.6%), Ag-102 (5.38%)
Radioactive daughters: Ag-102m, Ag-102

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.07558 [MeV]
Mean photon energy: 0.83803 [MeV]
Air kerma rate constant, Γ_{10} : 3.247×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.749×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.211×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

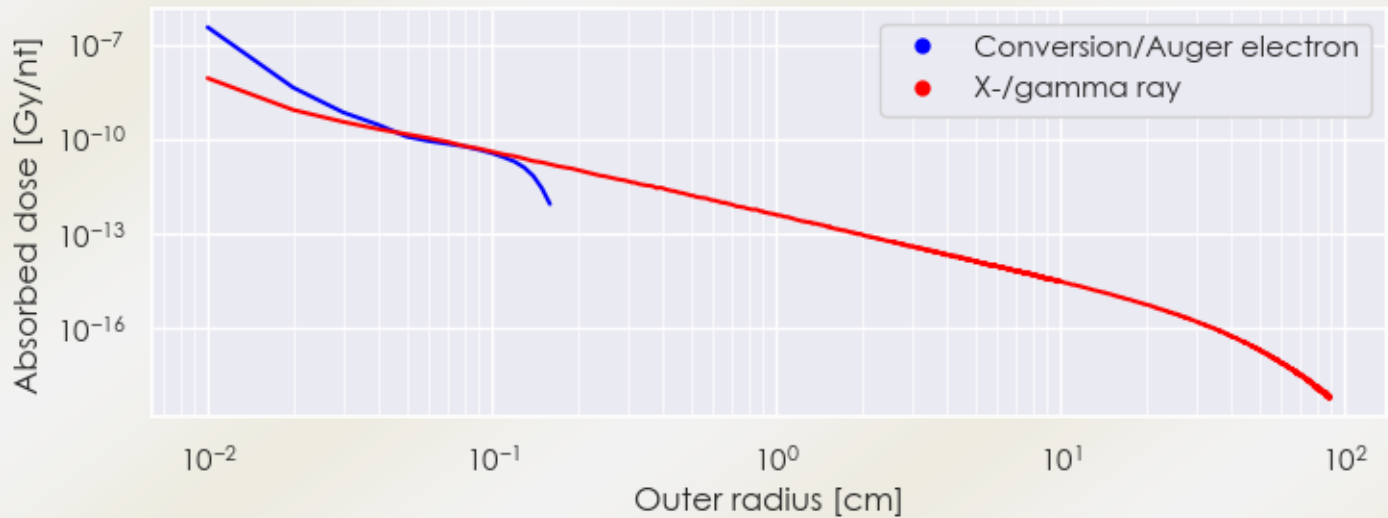
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.211×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.343×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

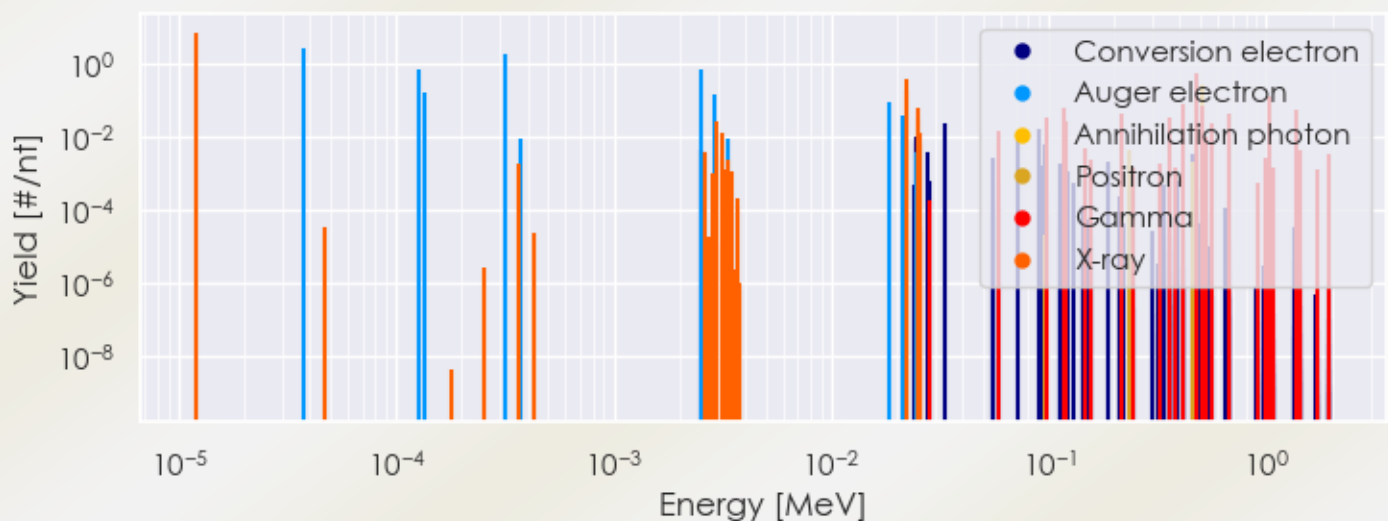
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Cd-102 DPK.csv

SUMMARY SPECTRA (PLOT)

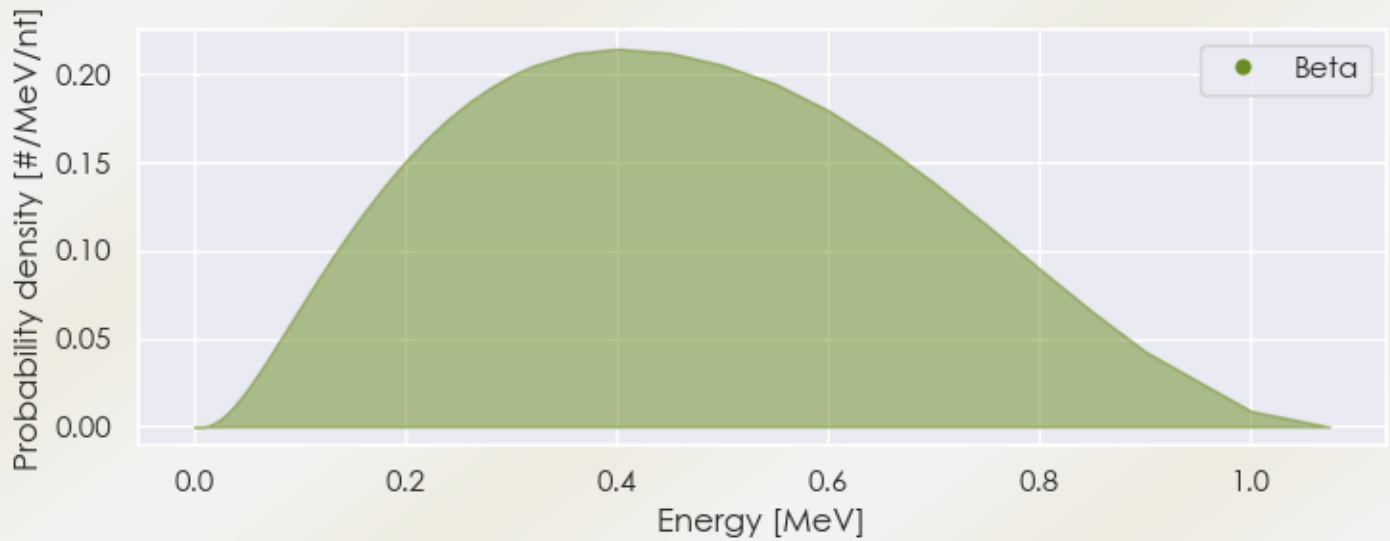
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Cd-102 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/Cd-102 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/Cd-102 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.20775e-05	7.508e+00	X-ray
2.97345e-03	2.700e-02	X-ray
3.14510e-03	1.322e-02	X-ray
2.19609e-02	1.978e-01	X-ray
2.21389e-02	3.728e-01	X-ray
2.48888e-02	3.251e-02	X-ray
2.49204e-02	6.316e-02	X-ray
2.54258e-02	1.278e-02	X-ray
5.90500e-02	1.440e-02	Gamma
9.74600e-02	3.540e-02	Gamma

1.16130e-01	6.540e-02	Gamma
1.20470e-01	2.760e-02	Gamma
2.13500e-01	4.500e-02	Gamma
3.60580e-01	3.360e-02	Gamma
4.15050e-01	7.680e-02	Gamma
4.81000e-01	6.000e-01	Gamma
5.05000e-01	7.560e-02	Gamma
5.11000e-01	2.594e-01	Annihilation photon
5.31200e-01	1.020e-02	Gamma
5.55000e-01	2.280e-02	Gamma
6.75650e-01	4.200e-02	Gamma
1.03610e+00	1.380e-01	Gamma
1.35920e+00	6.000e-02	Gamma
4.78233e-01	1.231e-01	Positron
3.78175e-05	2.735e+00	Auger electron
1.26970e-04	7.595e-01	Auger electron
1.34887e-04	1.681e-01	Auger electron
3.19028e-04	1.851e+00	Auger electron
2.49408e-03	7.072e-01	Auger electron
2.90208e-03	1.533e-01	Auger electron
1.84717e-02	9.562e-02	Auger electron
2.14605e-02	3.864e-02	Auger electron
2.46500e-02	1.093e-02	Conversion electron
3.35610e-02	2.407e-02	Conversion electron
7.19710e-02	1.408e-02	Conversion electron
9.06410e-02	1.592e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6