

Sn-108 (1.92m) ECB+		Sn-108 (10.30m) ECB+	Sn-109 (18.0m) ECB+	Sn-110 (4.11h) ECB+	Sn-111 (35.3m) ECB+	Sn-112 (STABLE)	Sn-113 (115.09d) EC	Sn-114 (STABLE)
In-105 (5.07m) ECB+	In-106 (6.2m) ECB+	In-107 (32.4m) ECB+	In-108 (5.0m) ECB+	In-109m (1.34m) IT	In-110 (4.11h) ECB+	In-111 (2.8047d) EC	In-112 (14.97m) ECB+B-	In-113 (STABLE)
Cd-104 (57.7m) EC	Cd-105 (55.5m) ECB+	Cd-106 (STABLE)	Cd-107 (6.50h) ECB+	Cd-108 (46.1d) EC	Cd-109 (1.26h) ECB+	Cd-110 (STABLE)	Cd-111 (STABLE)	Cd-112 (STABLE)

INDIUM-109M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: In-109m
Atomic number (Z): 49
Mass number (A): 109
Neutron number (N): 60

RADIOACTIVE DECAY

Decay modes: Internal transition
Half-life: 1.34 [m]
Decay constant: 8.6212e-03 [1/s]
Daughters: In-109 (100.0%)
Radioactive daughters: In-109

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.04159 [MeV]
Mean photon energy: 0.6085 [MeV]
Air kerma rate constant, Γ_{10} : 2.321e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 2.321e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.663e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

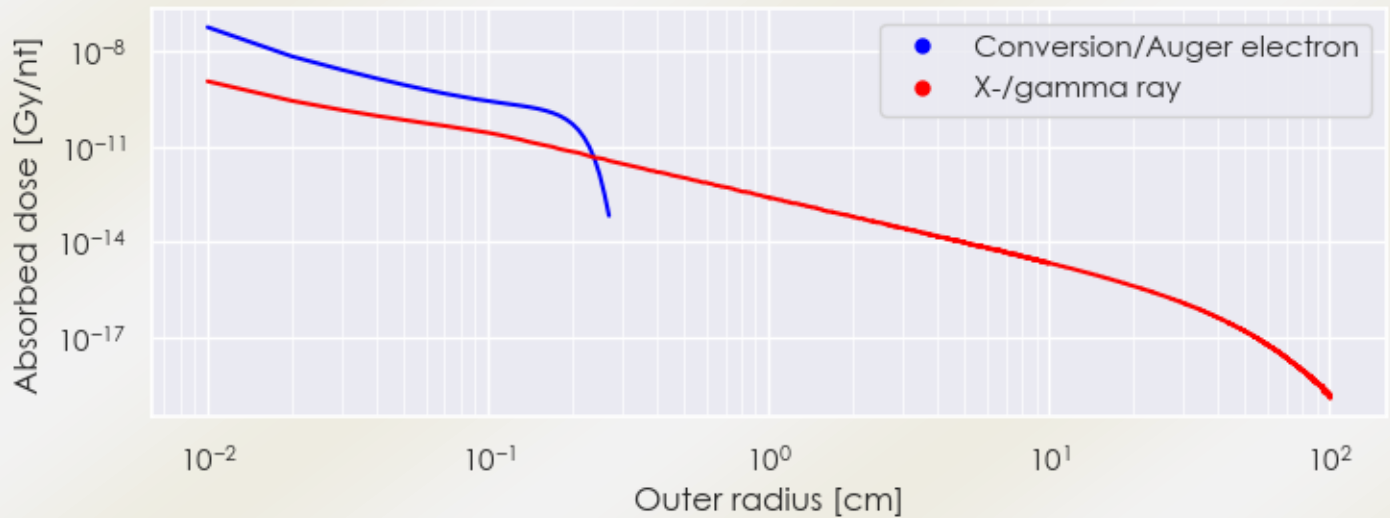
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-\beta+,e-}$: $6.663\text{e-}15$ [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : $9.749\text{e-}14$ [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

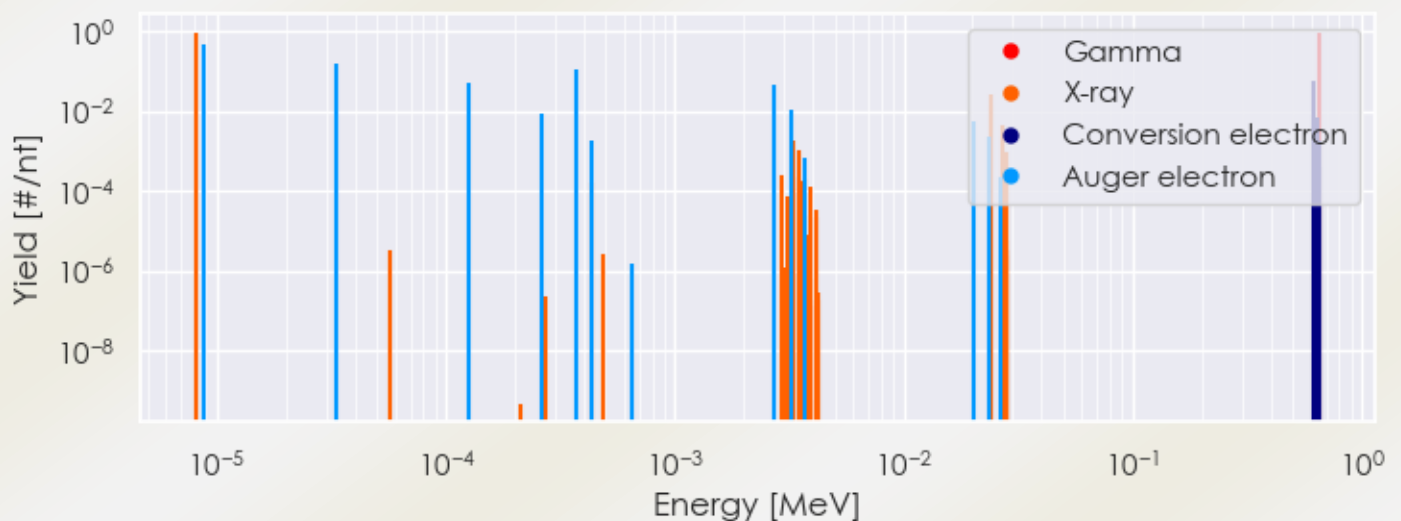
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/In-109m 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/In-109m Summary 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/In-109m Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/In-109m%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
8.12556e-06	9.243e-01	X-ray
2.39785e-02	1.350e-02	X-ray
2.41926e-02	2.532e-02	X-ray
6.50100e-01	9.342e-01	Gamma
8.85843e-06	4.584e-01	Auger electron
3.35313e-05	1.611e-01	Auger electron
1.25791e-04	5.014e-02	Auger electron
3.70819e-04	1.135e-01	Auger electron
2.73454e-03	4.499e-02	Auger electron
3.21482e-03	1.100e-02	Auger electron
6.22179e-01	5.493e-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.snm-mi.org/SNM-MI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6