

Zr-87 (1.68h) CB+	Zr-88 (83.4d) EC	Zr-89 (78.41h) ECB+	Zr-90 (STABLE)	Zr-91 (STABLE)	Zr-92 (STABLE)	Zr-93 (1.53E+6y) B-	Zr-94 (STABLE)	Zr-95 (64.032d) B-
Y-86 (14.74h) CB+	Y-87 (79.8h) ECB+	Y-88 (106.65d) ECB+	Y-89 (15.6h) B-	Y-90 (64.10h) B-	Y-91 (58.51d) B-	Y-92 (3.54h) B-	Y-93 (10.18h) B-	Y-94 (18.7m) B-
Sr-85 (64.84d) B-	Sr-86 (STABLE)	Sr-87 (STABLE)	Sr-88 (STABLE)	Sr-89 (15.04h) B-	Sr-90 (28.7y) B-	Sr-91 (9.63h) B-	Sr-92 (2.66h) B-	Sr-93 (7.423m) B-

YTTRIUM-90

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Y-90
Atomic number (Z): 39
Mass number (A): 90
Neutron number (N): 51

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 64.1 [h]
Decay constant: 3.0038×10^{-6} [1/s]
Daughters: Zr-90 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.9331 [MeV]
Mean photon energy: 0.0 [MeV]
Air kerma rate constant, Γ_{10} : 1.653×10^{-21} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.653×10^{-21} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.495×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $0.000 \times 10^{+00}$ [Gy $\cdot$ kg/Bq $\cdot$ s]

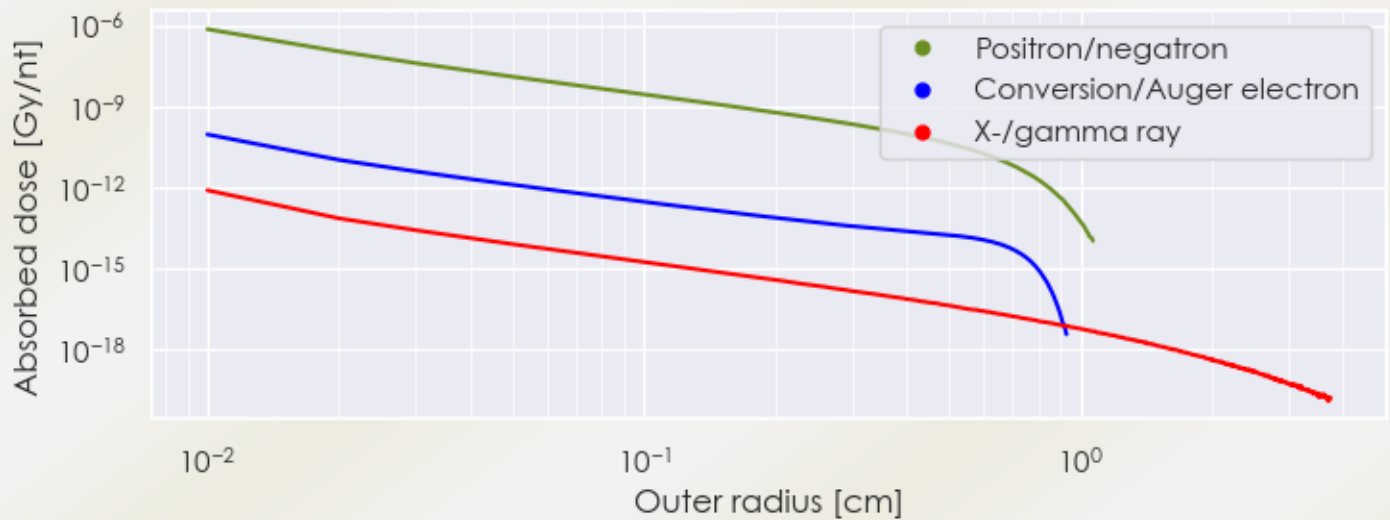
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta+,e-}$: 1.495e-13 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 0.000e+00 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

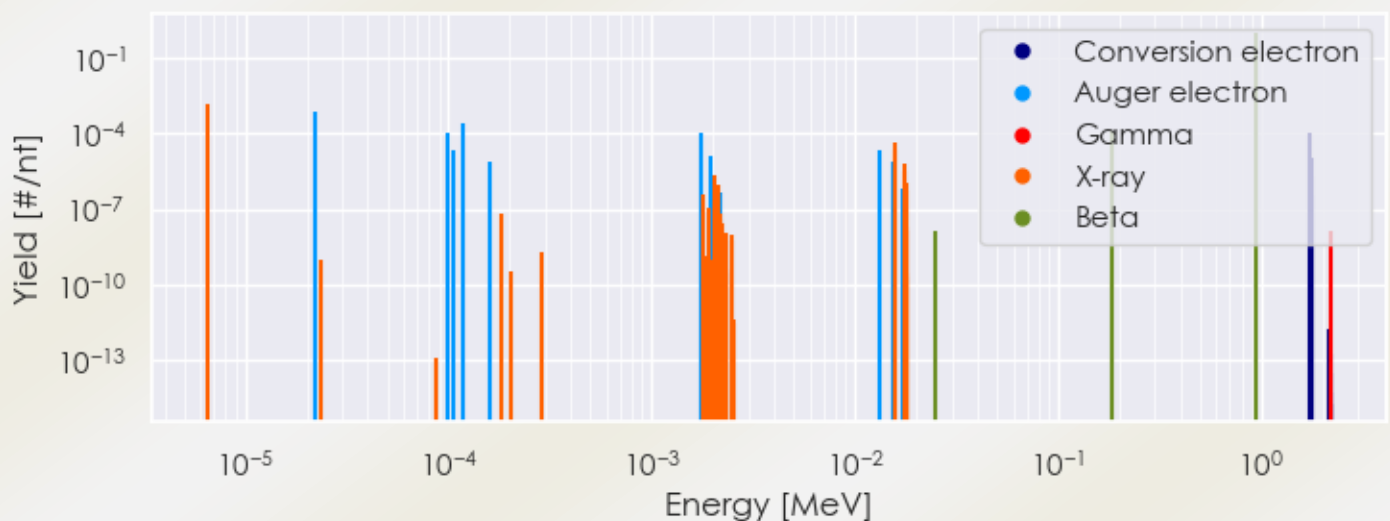
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Y-90 DPK.csv

SUMMARY SPECTRA (PLOT)

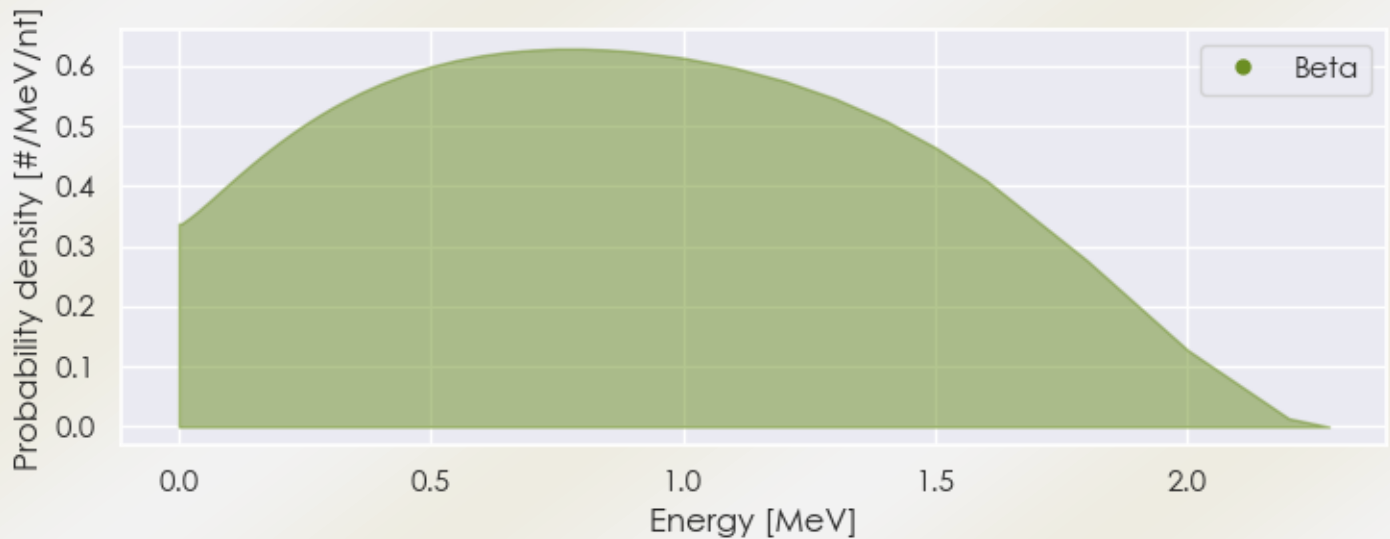
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Y-90 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/Y-90 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/Y-90 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
9.32991e-01	9.999e-01	Beta

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