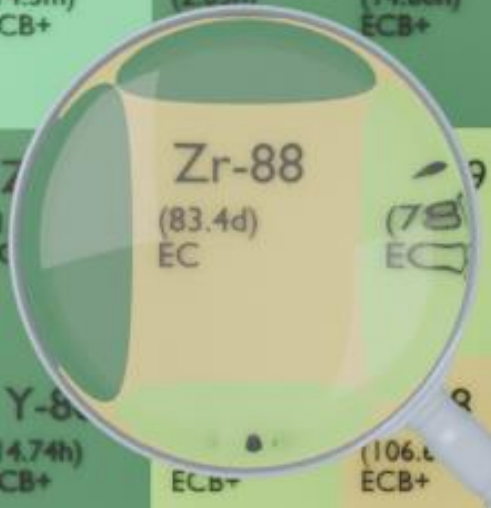




	IND-87 (3.75m) ECB+	IND-88 (14.5m) ECB+	IND-89 (2.03h) ECB+	IND-90 (14.60h) ECB+	IND-91 (680y) ECB+	IND-92 (3.47E+7y) EC	IND-93 (STABLE)
Zr-85 (7.86m) ECB+	Zr-86 (16.5h) ECB+	Zr-87 (1.1h) ECB+	Zr-88 (83.4d) EC	Zr-89 (78.4d) ECB+	Zr-90 (STABLE)	Zr-91 (STABLE)	Zr-92 (STABLE)
Y-83 (7.08m) CB+	Y-84 (2.68h) ECB+	Y-85 (14.74h) ECB+	Y-86 (106.6h) ECB+	Y-87 (106.6h) ECB+	Y-88 (STABLE)	Y-89 (STABLE)	Y-90 (64.10h) B-
						Y-91 (58.51d) B-	

ZIRCONIUM-88

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Zr-88
Atomic number (Z): 40
Mass number (A): 88
Neutron number (N): 48

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 83.4 [d]
Decay constant: $9.6193\text{e-}08$ [1/s]
Daughters: Y-88 (100.0%)
Radioactive daughters: Y-88

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.01603 [MeV]
Mean photon energy: 0.39177 [MeV]
Air kerma rate constant, Γ_{10} : $3.004\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Air kerma coefficient, K_{air} : $3.004\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $2.568\text{e-}15$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]

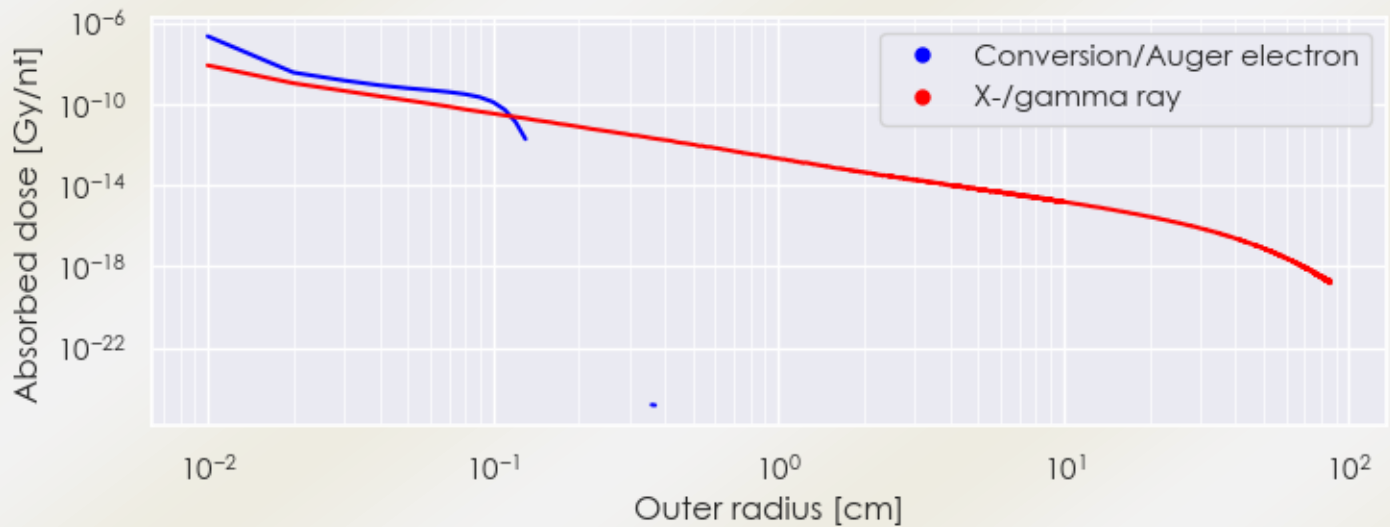
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 2.568×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 6.277×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

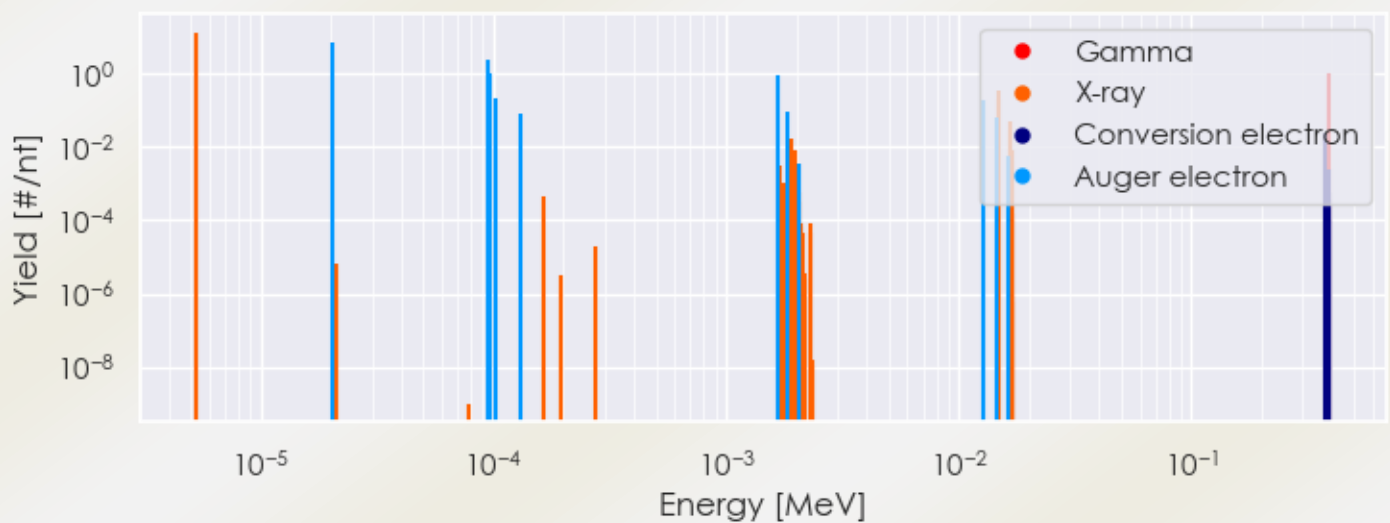
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Zr-88 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/Zr-88 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/Zr-88 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Zr-88%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / n _t] if > 0.01	Radiation type
5.29809e-06	1.343e+01	X-ray
1.91499e-03	1.679e-02	X-ray
1.48403e-02	1.828e-01	X-ray
1.49185e-02	3.503e-01	X-ray
1.66877e-02	2.715e-02	X-ray
1.67001e-02	5.289e-02	X-ray
3.92900e-01	9.727e-01	Gamma
2.02932e-05	7.471e+00	Auger electron
9.46072e-05	2.289e+00	Auger electron
9.60604e-05	1.022e+00	Auger electron
1.01269e-04	2.183e-01	Auger electron
1.31786e-04	8.423e-02	Auger electron
1.66249e-03	9.594e-01	Auger electron
1.82745e-03	9.607e-02	Auger electron
1.26657e-02	1.881e-01	Auger electron
1.45497e-02	6.539e-02	Auger electron
3.75900e-01	2.340e-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