



OSMIUM-193

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Os-193
Atomic number (Z): 76
Mass number (A): 193
Neutron number (N): 117

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 30.11 [h]
Decay constant: 6.3946×10^{-6} [1/s]
Daughters: Ir-193m (0.348%), Ir-193 (99.7%)
Radioactive daughters: Ir-193m

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.37968 [MeV]
Mean photon energy: 0.06742 [MeV]
Air kerma rate constant, Γ_{10} : 4.819×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 4.819×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.083×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

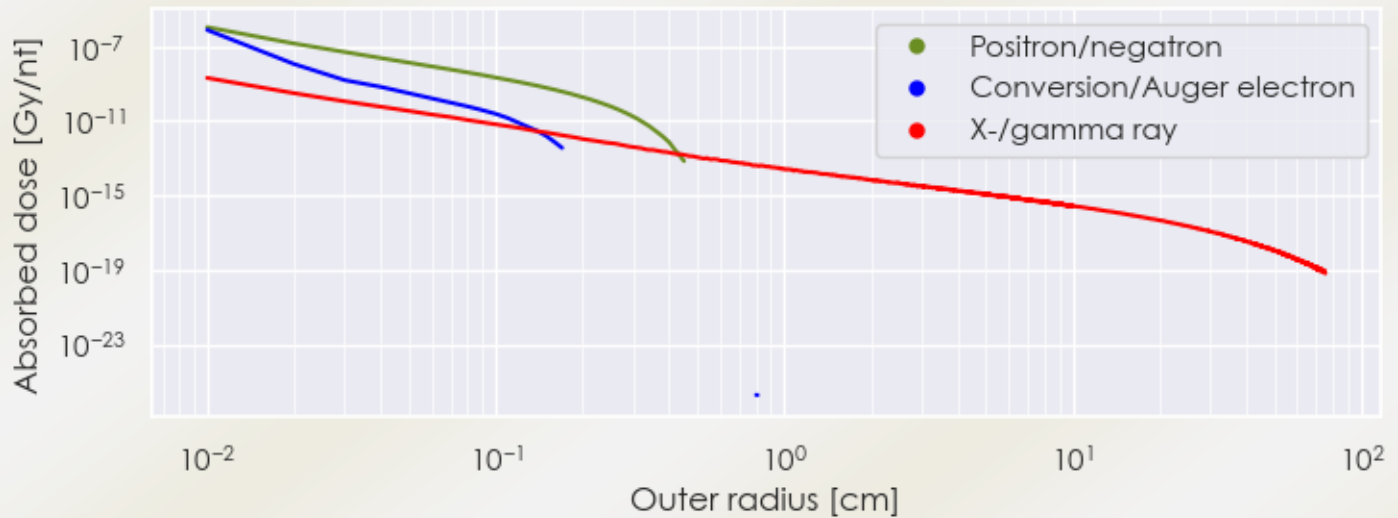
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 6.083×10^{-14} [Gy · kg/Bq · s]

Equilibrium dose constant for photons, Δ_p : 1.080×10^{-14} [Gy · kg/Bq · s]

DOSE POINT KERNELS (PLOT)

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

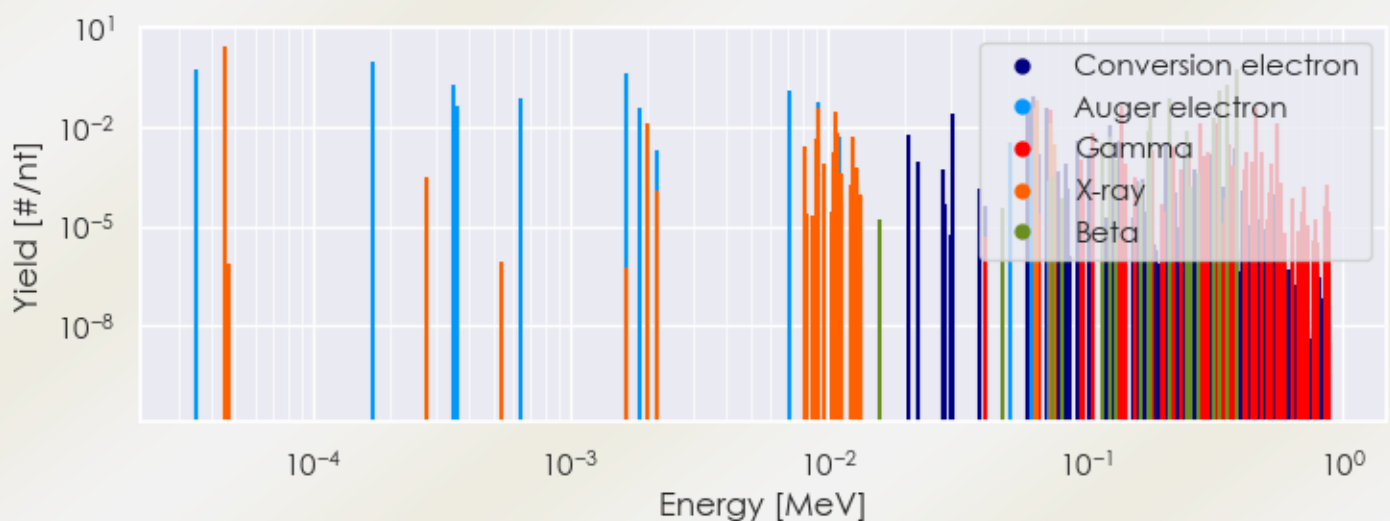
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Os-193 DPK.csv

SUMMARY SPECTRA (PLOT)

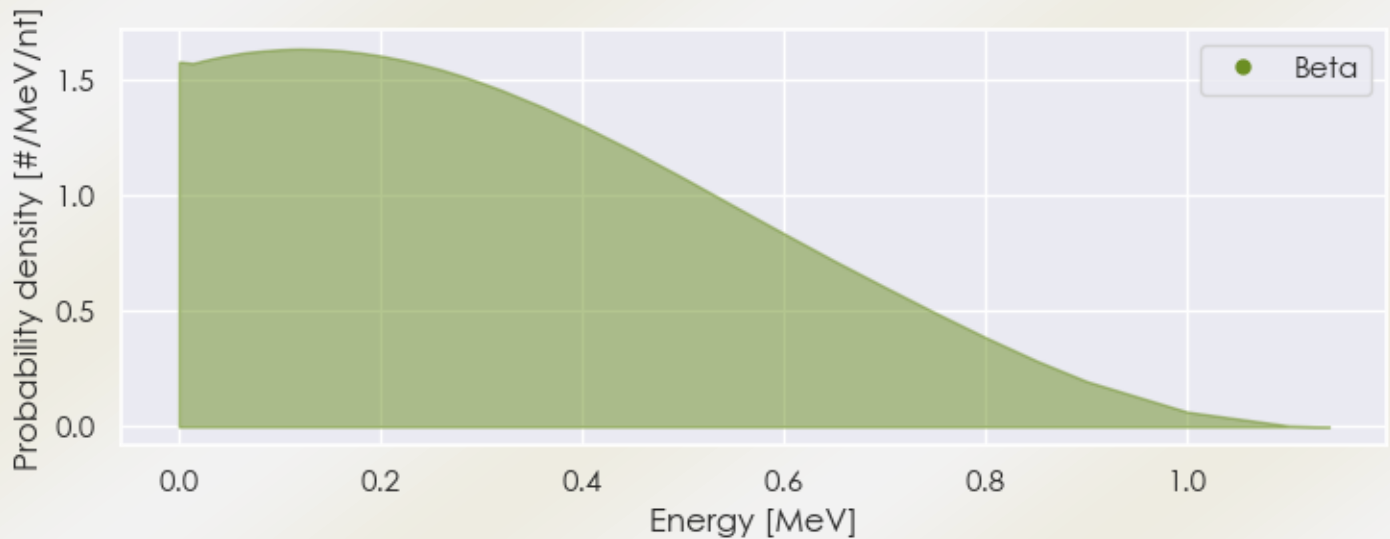
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Os-193 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/Os-193 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/Os-193 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
4.54188e-05	2.875e+00	X-ray
1.99529e-03	1.349e-02	X-ray
9.16923e-03	3.849e-02	X-ray
1.07358e-02	2.819e-02	X-ray
6.34550e-02	3.734e-02	X-ray
6.50999e-02	6.405e-02	X-ray
7.30400e-02	3.239e-02	Gamma
7.37750e-02	1.351e-02	X-ray
1.38920e-01	4.266e-02	Gamma
2.80444e-01	1.244e-02	Gamma

3.21590e-01	1.276e-02	Gamma
3.87480e-01	1.260e-02	Gamma
4.60490e-01	3.950e-02	Gamma
5.57360e-01	1.303e-02	Gamma
1.77562e-01	2.390e-02	Beta
2.11846e-01	7.867e-02	Beta
3.16170e-01	2.091e-02	Beta
3.32002e-01	1.235e-01	Beta
3.57610e-01	1.792e-01	Beta
3.86314e-01	5.477e-01	Beta
3.53931e-05	5.488e-01	Auger electron
1.71192e-04	9.473e-01	Auger electron
3.54155e-04	1.934e-01	Auger electron
3.61924e-04	4.228e-02	Auger electron
6.44303e-04	7.103e-02	Auger electron
1.64437e-03	4.562e-01	Auger electron
1.84577e-03	4.028e-02	Auger electron
7.12402e-03	1.354e-01	Auger electron
9.10178e-03	5.498e-02	Auger electron
3.06940e-02	2.710e-02	Conversion electron
5.96440e-02	4.996e-02	Conversion electron
6.01810e-02	5.563e-02	Conversion electron
6.18260e-02	4.894e-02	Conversion electron
6.26060e-02	8.160e-02	Conversion electron
7.05010e-02	3.842e-02	Conversion electron
7.30400e-02	1.127e-02	Conversion electron
1.25524e-01	1.203e-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