



IRIDIUM-184

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ir-184
Atomic number (Z): 77
Mass number (A): 184
Neutron number (N): 107

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 3.09 [h]
Decay constant: $6.2311\text{e-}05$ [1/s]
Daughters: Os-184 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.3194 [MeV]
Mean photon energy: 1.96436 [MeV]
Air kerma rate constant, Γ_{10} : $7.317\text{e-}17$ [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : $7.991\text{e-}17$ [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $5.117\text{e-}14$ [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [Gy·kg/Bq·s]

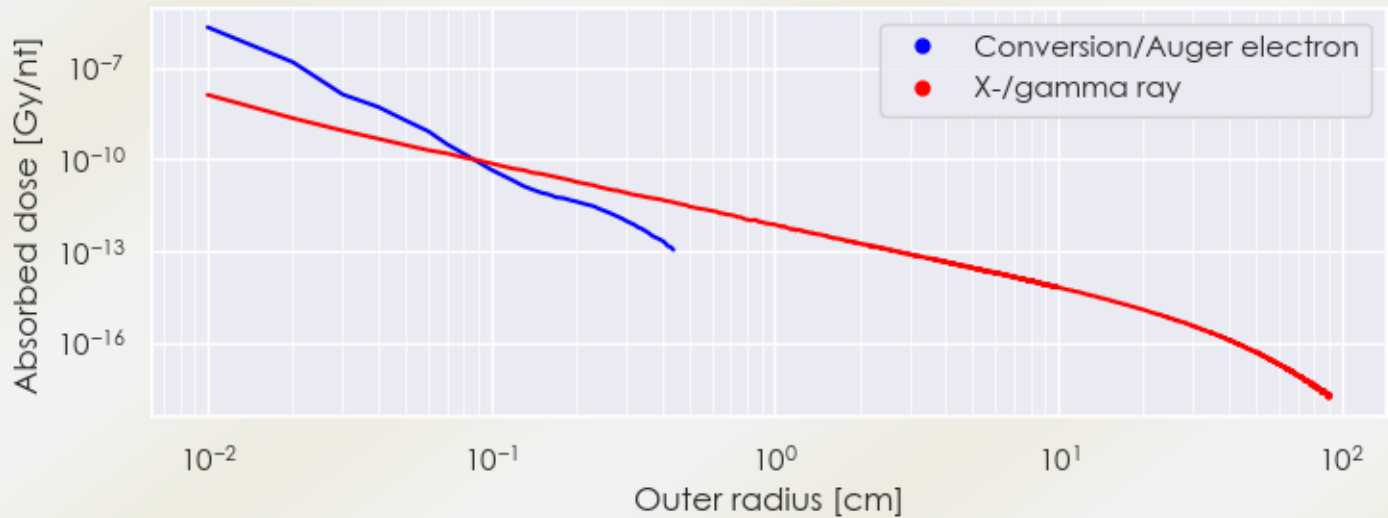
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 5.117×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.147×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

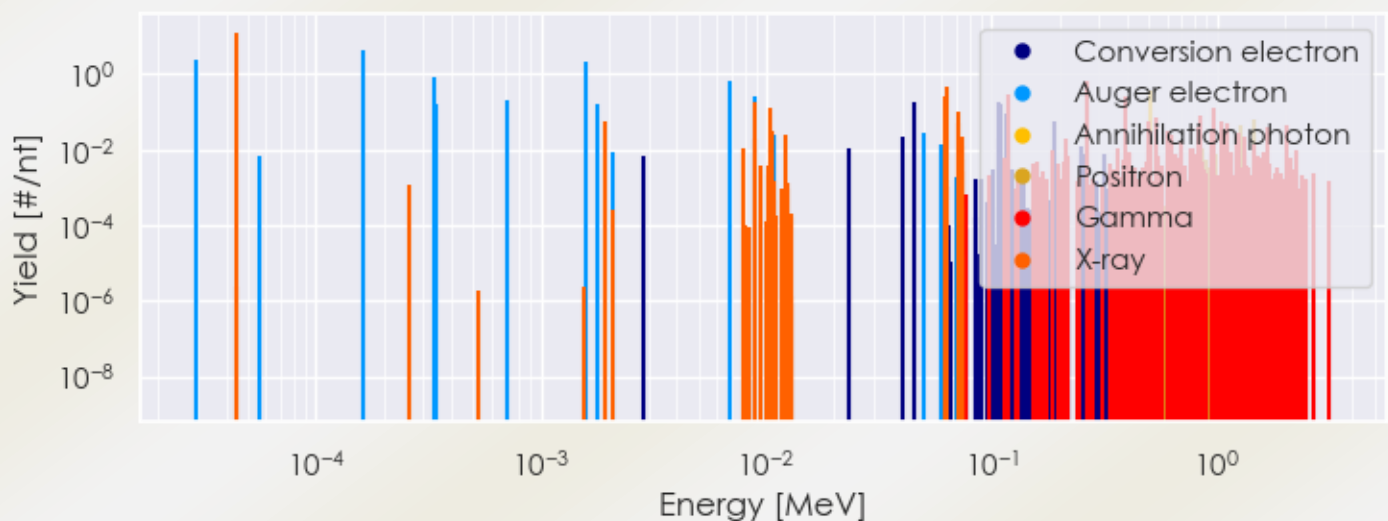
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ir-184 DPK.csv

SUMMARY SPECTRA (PLOT)

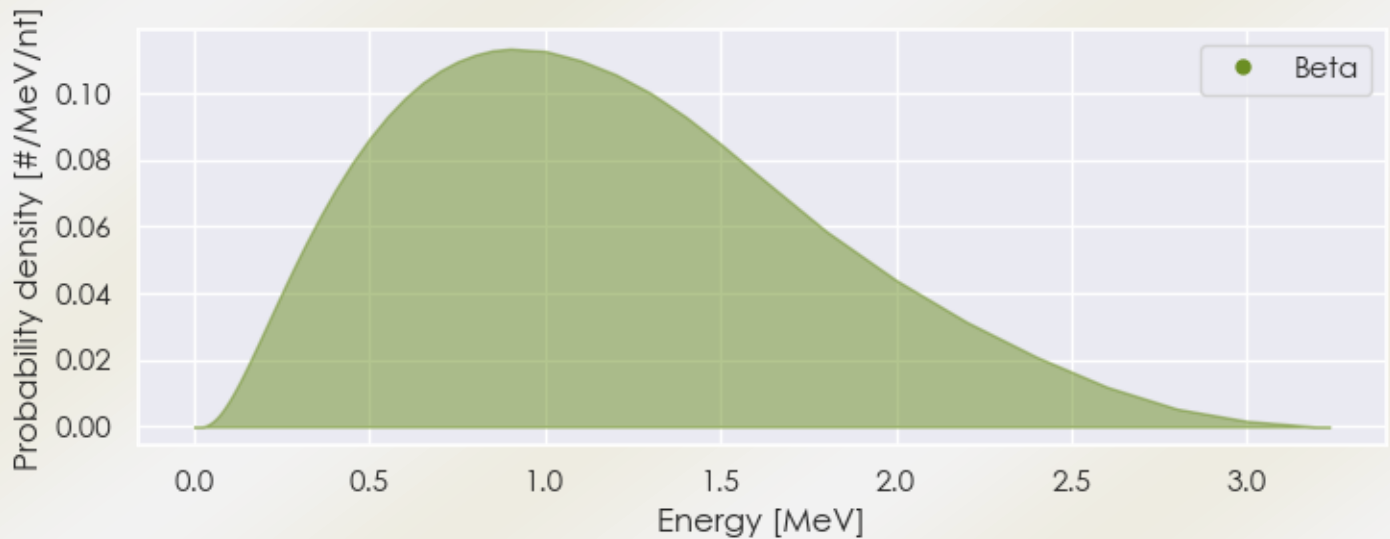
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ir-184 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/Ir-184 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/Ir-184 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
4.40849e-05	1.284e+01	X-ray
1.92141e-03	5.587e-02	X-ray
7.84700e-03	1.131e-02	X-ray
8.83249e-03	1.945e-02	X-ray
8.90608e-03	1.715e-01	X-ray
1.03795e-02	1.347e-01	X-ray
1.05947e-02	3.106e-02	X-ray
1.21269e-02	2.568e-02	X-ray
6.16420e-02	2.732e-01	X-ray
6.31890e-02	4.706e-01	X-ray

7.12758e-02	5.110e-02	X-ray
7.16144e-02	9.876e-02	X-ray
7.35200e-02	1.177e-02	X-ray
7.35997e-02	2.288e-02	X-ray
1.19790e-01	3.053e-01	Gamma
2.12020e-01	1.870e-02	Gamma
2.63980e-01	6.800e-01	Gamma
3.64720e-01	1.129e-02	Gamma
3.90360e-01	2.591e-01	Gamma
4.93110e-01	5.848e-02	Gamma
5.02950e-01	2.958e-02	Gamma
5.11000e-01	3.485e-01	Annihilation photon
5.39690e-01	6.800e-02	Gamma
6.01160e-01	3.250e-02	Gamma
6.13820e-01	1.333e-02	Gamma
6.26590e-01	2.455e-02	Gamma
6.97260e-01	1.686e-02	Gamma
7.67490e-01	1.156e-02	Gamma
7.78250e-01	1.081e-02	Gamma
8.22970e-01	3.808e-02	Gamma
8.26050e-01	1.285e-02	Gamma
8.39100e-01	1.448e-02	Gamma
8.41330e-01	7.956e-02	Gamma
9.42870e-01	3.672e-02	Gamma
9.44140e-01	2.734e-02	Gamma
9.61260e-01	1.244e-01	Gamma
1.04455e+00	5.372e-02	Gamma
1.06220e+00	2.448e-02	Gamma
1.06621e+00	1.530e-02	Gamma
1.10528e+00	5.304e-02	Gamma
1.22940e+00	1.217e-02	Gamma
1.23693e+00	2.101e-02	Gamma
1.24781e+00	2.666e-02	Gamma
1.33430e+00	2.332e-02	Gamma
1.45789e+00	1.380e-02	Gamma
1.67240e+00	3.740e-02	Gamma
2.06300e+00	4.556e-02	Gamma
8.61575e-01	1.042e-02	Positron

1.08146e+00	1.251e-02	Positron
1.28431e+00	4.274e-02	Positron
1.46126e+00	6.046e-02	Positron
2.95925e-05	2.497e+00	Auger electron
1.63722e-04	4.273e+00	Auger electron
3.34268e-04	8.507e-01	Auger electron
3.42719e-04	1.713e-01	Auger electron
7.00899e-04	2.013e-01	Auger electron
1.58329e-03	2.041e+00	Auger electron
1.78098e-03	1.600e-01	Auger electron
6.91293e-03	6.359e-01	Auger electron
8.81259e-03	2.527e-01	Auger electron
1.07410e-02	2.477e-02	Auger electron
2.33340e-02	1.143e-02	Conversion electron
4.06040e-02	2.100e-02	Conversion electron
4.57240e-02	1.771e-01	Conversion electron
4.99348e-02	2.698e-02	Auger electron
5.97656e-02	1.430e-02	Auger electron
1.06840e-01	2.020e-02	Conversion electron
1.07366e-01	1.884e-01	Conversion electron
1.08913e-01	1.546e-01	Conversion electron
1.17338e-01	9.306e-02	Conversion electron
1.19790e-01	2.659e-02	Conversion electron
1.89914e-01	5.590e-02	Conversion electron
2.51556e-01	1.302e-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