

Ir-187 (2.35h) ECB+	Ir-188 (10.2d) ECA	Ir-189 (10.87h) ECB+	Ir-190 (6.50E+11y) A	Ir-191 (2.802d) EC	Ir-192 (STABLE)	Ir-193 (50y) EC	Ir-194 (STABLE)	Ir-195 (STABLE)
Os-186 (16.64h) ECB+	Os-187 (10.5h) ECB+	Os-188 (41.5h) ECB+	Os-189 (11.78d) EC	Os-190 (STABLE)	Os-191 (73.827d) B-EC	Os-192 (STABLE)	Os-193 (19.28h) B-	Os-194 (30.11h) B-

IRIDIUM-190

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ir-190
Atomic number (Z): 77
Mass number (A): 190
Neutron number (N): 113

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 11.78 [d]
Decay constant: 6.8103×10^{-7} [1/s]
Daughters: Os-190 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.07456 [MeV]
Mean photon energy: 1.47679 [MeV]
Air kerma rate constant, Γ_{10} : 6.326×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 6.326×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.195×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

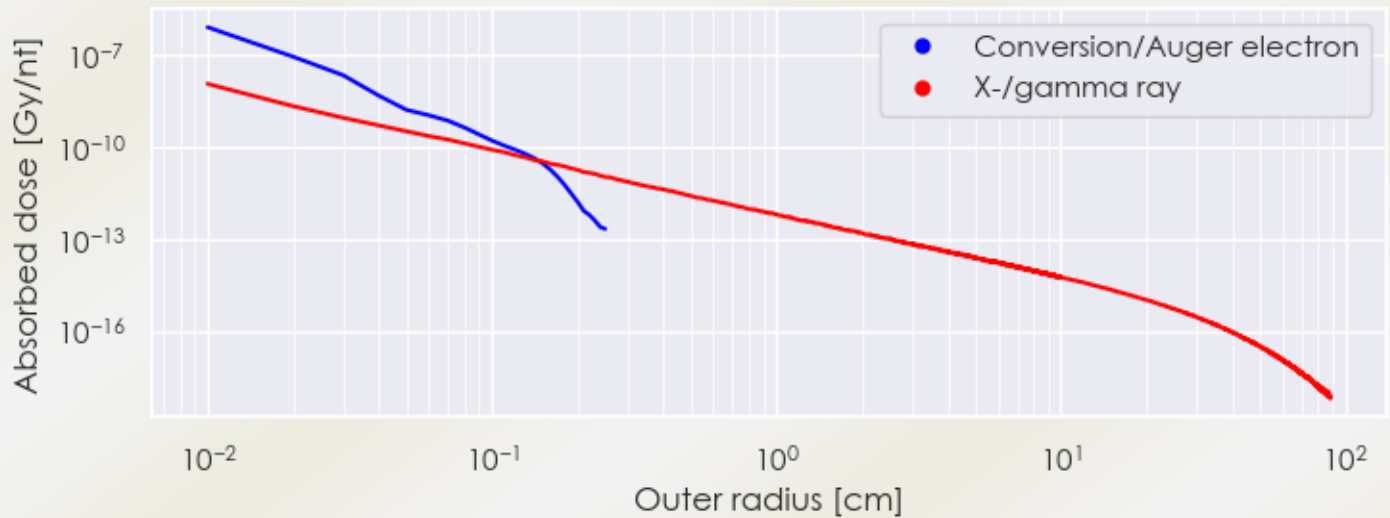
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 1.195×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.366×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

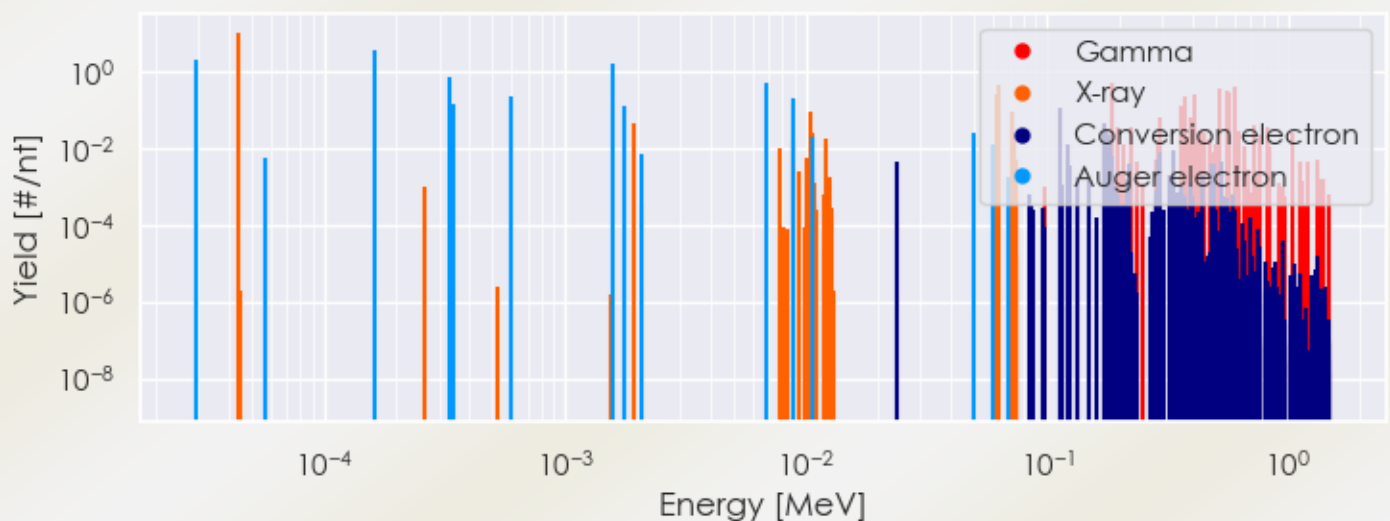
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ir-190 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-190 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/Ir-190 Summary Spectrum.csv

Energy [MeV]	Yield [# /nt] if > 0.01	Radiation type
4.40296e-05	1.059e+01	X-ray
1.92067e-03	4.597e-02	X-ray
8.83249e-03	1.618e-02	X-ray
8.90608e-03	1.427e-01	X-ray
1.03795e-02	9.214e-02	X-ray
1.05947e-02	2.585e-02	X-ray
1.21269e-02	1.756e-02	X-ray
6.16420e-02	2.512e-01	X-ray
6.31890e-02	4.327e-01	X-ray
7.12758e-02	4.697e-02	X-ray
7.16144e-02	9.079e-02	X-ray
7.35200e-02	1.082e-02	X-ray
7.35997e-02	2.103e-02	X-ray
1.86680e-01	5.244e-01	Gamma
1.96850e-01	3.420e-02	Gamma
1.98080e-01	1.938e-02	Gamma
2.07910e-01	1.186e-02	Gamma
2.23810e-01	3.739e-02	Gamma
2.88220e-01	1.642e-02	Gamma
2.94750e-01	6.612e-02	Gamma
3.61090e-01	1.302e-01	Gamma
3.71240e-01	2.280e-01	Gamma
3.80030e-01	2.029e-02	Gamma
3.97360e-01	6.544e-02	Gamma
4.07220e-01	4.560e-02	Gamma
4.07220e-01	2.394e-01	Gamma
4.20630e-01	1.642e-02	Gamma

4.31620e-01	2.736e-02	Gamma
4.47810e-01	2.554e-02	Gamma
4.77800e-01	1.824e-02	Gamma
5.02550e-01	1.254e-02	Gamma
5.18550e-01	3.397e-01	Gamma
5.57950e-01	3.010e-01	Gamma
5.69300e-01	2.850e-01	Gamma
6.05140e-01	3.990e-01	Gamma
6.30910e-01	2.941e-02	Gamma
6.56020e-01	1.163e-02	Gamma
7.26220e-01	3.785e-02	Gamma
7.68570e-01	2.212e-02	Gamma
8.28990e-01	3.466e-02	Gamma
8.39140e-01	1.140e-02	Gamma
1.03605e+00	2.417e-02	Gamma
2.96117e-05	2.065e+00	Auger electron
1.63597e-04	3.514e+00	Auger electron
3.34387e-04	7.049e-01	Auger electron
3.44327e-04	1.418e-01	Auger electron
5.98436e-04	2.316e-01	Auger electron
1.58164e-03	1.680e+00	Auger electron
1.77843e-03	1.314e-01	Auger electron
6.88576e-03	5.101e-01	Auger electron
8.78527e-03	2.026e-01	Auger electron
1.07145e-02	1.986e-02	Auger electron
4.99348e-02	2.480e-02	Auger electron
5.97656e-02	1.314e-02	Auger electron
1.12614e-01	1.065e-01	Conversion electron
1.22784e-01	1.276e-02	Conversion electron
1.73730e-01	1.255e-02	Conversion electron
1.74256e-01	4.464e-02	Conversion electron
1.75803e-01	3.074e-02	Conversion electron
1.84228e-01	2.225e-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