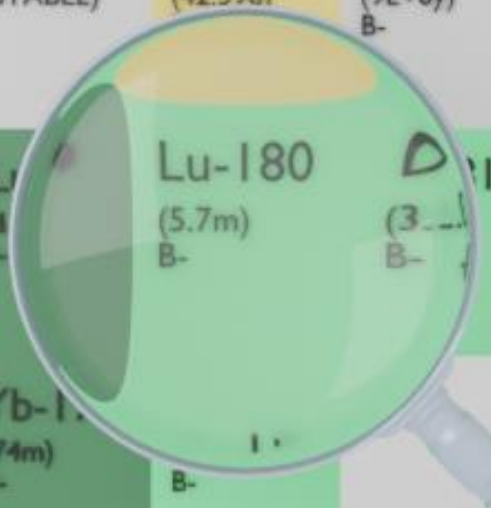




Lu-176 (3.85E+10y) B-	Lu-177 (6.647d) B-	Lu-178 (28.4m) B-	Lu-179 (4.32h) B-	Lu-180 (5.7m) B-	Lu-181 (42.39d) B-	Lu-182 (9E+6y) B-	Lu-183 (1.067h) B-	Lu-184 (4.12h) B-
Yb-175 (4.185d) B-	Yb-176 (STABLE)	Yb-177 (1.911h) B-	Yb-178 (74m) B-	Yb-179 (3.2m) B-	Yb-180 (3.2m) B-	Yb-181 (4.21h) B-	Yb-182 (1.51E+10y) B-	Yb-183 (4.81E+10y) B-

LUTETIUM-180

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Lu-180
Atomic number (Z): 71
Mass number (A): 180
Neutron number (N): 109

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 5.7 [m]
Decay constant: 2.0267e-03 [1/s]
Daughters: Hf-180 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.63518 [MeV]
Mean photon energy: 1.51475 [MeV]
Air kerma rate constant, Γ_{10} : 5.307e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 5.307e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.018e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

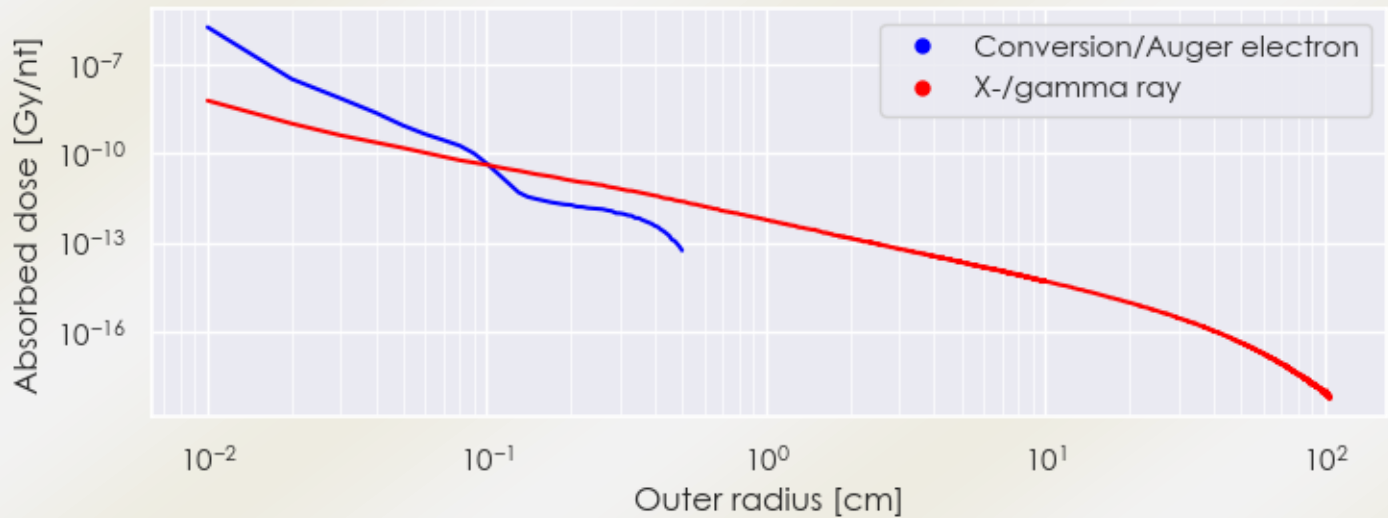
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.018×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.427×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

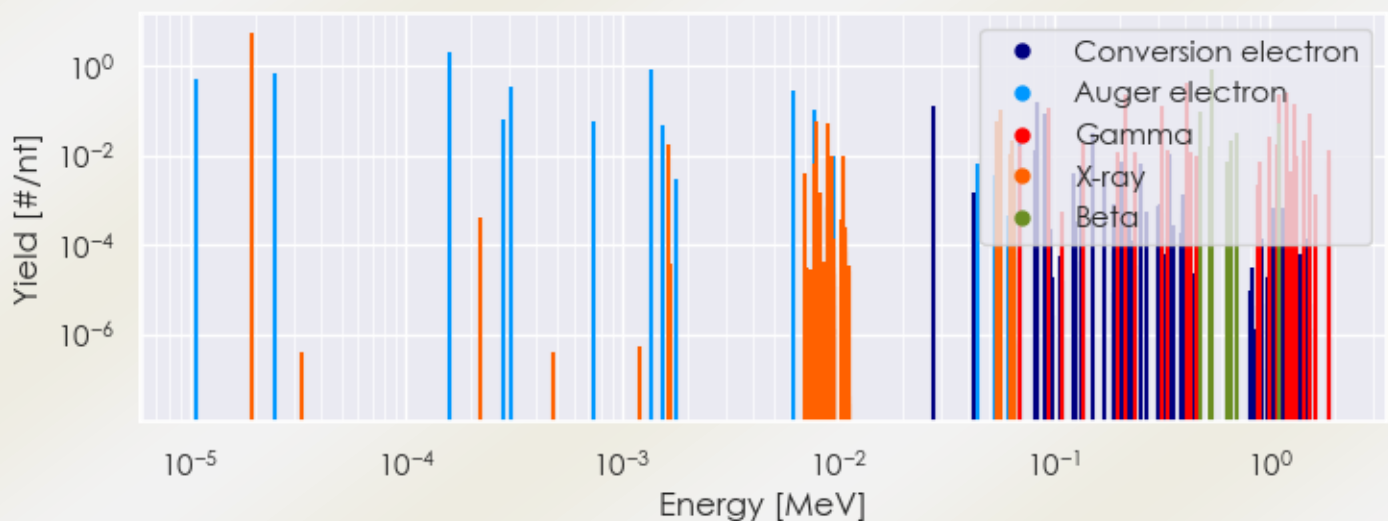
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Lu-180 DPK.csv

SUMMARY SPECTRA (PLOT)

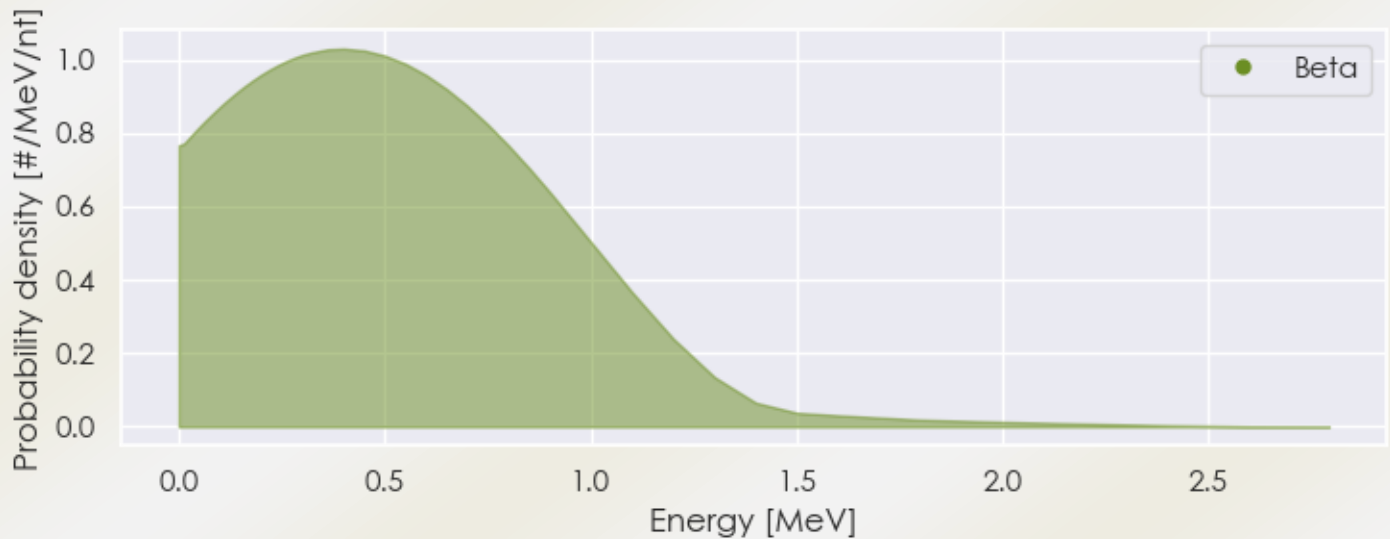
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Lu-180 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/Lu-180 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/Lu-180 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.94313e-05	5.587e+00	X-ray
1.63917e-03	1.695e-02	X-ray
7.88959e-03	5.544e-02	X-ray
9.03751e-03	5.216e-02	X-ray
5.47191e-02	5.968e-02	X-ray
5.59237e-02	1.044e-01	X-ray
6.31238e-02	1.112e-02	X-ray
6.33831e-02	2.148e-02	X-ray
6.90000e-02	1.505e-02	Gamma
9.33080e-02	1.174e-01	Gamma

1.35000e-01	1.849e-02	Gamma
1.98300e-01	1.118e-02	Gamma
2.15241e-01	2.206e-01	Gamma
2.34900e-01	1.118e-02	Gamma
3.16500e-01	1.290e-01	Gamma
3.33000e-01	1.247e-02	Gamma
4.07960e-01	4.300e-01	Gamma
4.24400e-01	1.204e-02	Gamma
9.82700e-01	2.580e-02	Gamma
1.06640e+00	1.763e-02	Gamma
1.08990e+00	1.161e-02	Gamma
1.10100e+00	1.634e-02	Gamma
1.10660e+00	2.266e-01	Gamma
1.19790e+00	1.385e-01	Gamma
1.19970e+00	2.425e-01	Gamma
1.29930e+00	1.346e-01	Gamma
1.43410e+00	2.064e-02	Gamma
1.51440e+00	8.600e-02	Gamma
1.88830e+00	1.247e-02	Gamma
4.78153e-01	9.073e-02	Beta
5.27784e-01	1.512e-02	Beta
5.34126e-01	7.863e-01	Beta
6.56908e-01	2.016e-02	Beta
7.03510e-01	3.024e-02	Beta
1.09839e+00	5.040e-02	Beta
1.07244e-05	4.851e-01	Auger electron
2.44606e-05	6.882e-01	Auger electron
1.59990e-04	1.949e+00	Auger electron
2.81760e-04	6.139e-02	Auger electron
3.03604e-04	3.317e-01	Auger electron
7.34363e-04	5.593e-02	Auger electron
1.36648e-03	8.486e-01	Auger electron
1.54594e-03	4.483e-02	Auger electron
6.20594e-03	2.764e-01	Auger electron
7.82616e-03	1.027e-01	Auger electron
2.78260e-02	1.285e-01	Conversion electron
6.95180e-02	2.718e-02	Conversion electron
8.20630e-02	1.309e-02	Conversion electron

8.25450e-02	1.605e-01	Conversion electron
8.37497e-02	1.510e-01	Conversion electron
9.12090e-02	8.125e-02	Conversion electron
9.33080e-02	2.202e-02	Conversion electron
1.49759e-01	3.000e-02	Conversion electron
3.42478e-01	1.065e-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