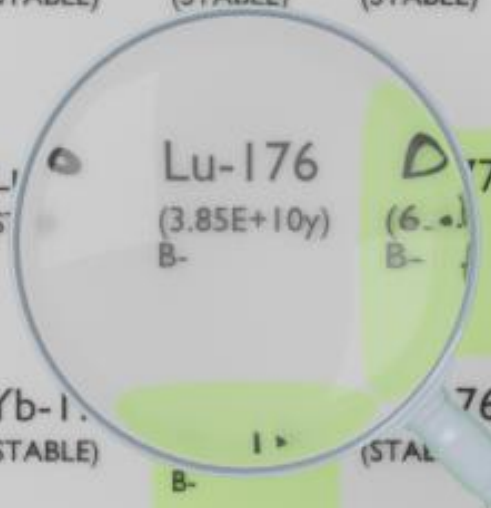




Lu-172 (5.70d) ECB+	Lu-173 (1.37y) EC	Lu-174 (3.31y) ECB+	Lu-175 (97.01d) EC	Lu-176 (3.85E+10y) B-	Lu-177 (6.65d) B-	Lu-178 (28.4m) B-	Lu-179 (4.59h) B-	Lu-180 (5.7m) B-
Yb-171 (STABLE)	Yb-172 (STABLE)	Yb-173 (STABLE)	Yb-174 (STABLE)	Yb-175 (STABLE)	Yb-176 (STABLE)	Yb-177 (1.911h) B-	Yb-178 (74m) B-	Yb-179 (8.0m) B-

LUTETIUM-176

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Lu-176
Atomic number (Z): 71
Mass number (A): 176
Neutron number (N): 105

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 38500000000.0 [y]
Decay constant: 5.7052e-19 [1/s]
Daughters: Hf-176 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.30261 [MeV]
Mean photon energy: 0.4799 [MeV]
Air kerma rate constant, Γ_{10} : 1.811e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 1.811e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 4.848e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

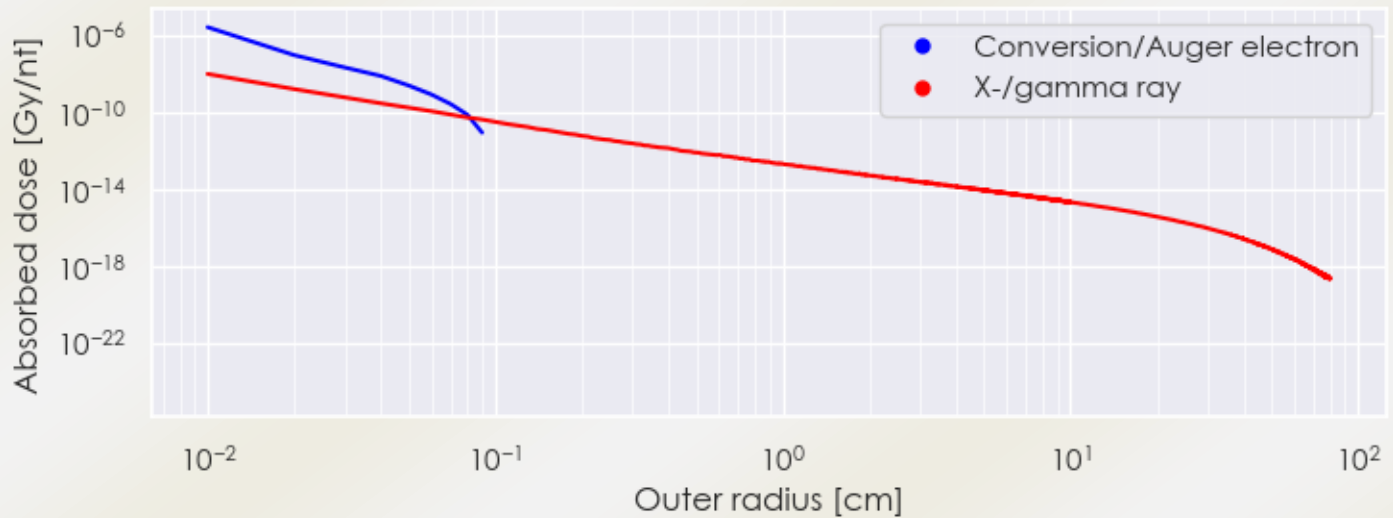
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 4.848×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 7.689×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

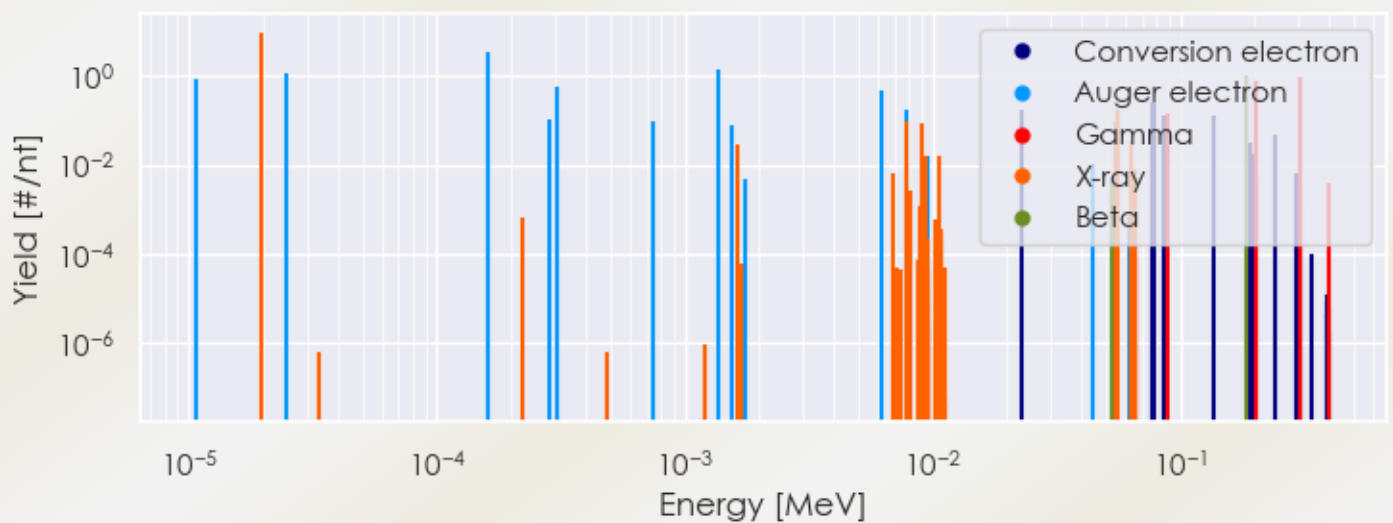
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Lu-176 DPK.csv

SUMMARY SPECTRA (PLOT)

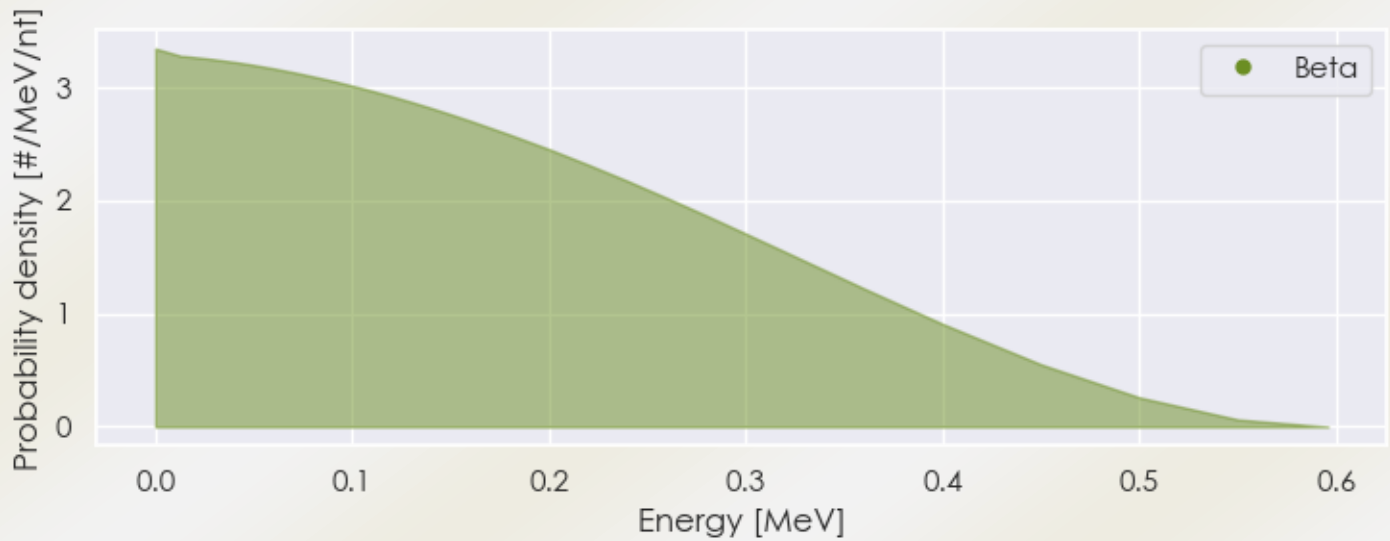
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Lu-176 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-176 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-176 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.94320e-05	9.358e+00	X-ray
1.63924e-03	2.839e-02	X-ray
7.83281e-03	1.047e-02	X-ray
7.88959e-03	9.243e-02	X-ray
9.03751e-03	8.829e-02	X-ray
9.34358e-03	1.606e-02	X-ray
1.05374e-02	1.606e-02	X-ray
5.47191e-02	9.468e-02	X-ray
5.59237e-02	1.656e-01	X-ray
6.31238e-02	1.763e-02	X-ray

6.33831e-02	3.408e-02	X-ray
8.83600e-02	1.451e-01	Gamma
2.01830e-01	7.797e-01	Gamma
3.06840e-01	9.360e-01	Gamma
1.83185e-01	9.961e-01	Beta
1.07203e-05	8.124e-01	Auger electron
2.44605e-05	1.153e+00	Auger electron
1.60000e-04	3.264e+00	Auger electron
2.81738e-04	1.029e-01	Auger electron
3.03709e-04	5.560e-01	Auger electron
7.42368e-04	9.190e-02	Auger electron
1.36661e-03	1.421e+00	Auger electron
1.54616e-03	7.509e-02	Auger electron
6.20858e-03	4.630e-01	Auger electron
7.82888e-03	1.720e-01	Auger electron
9.47921e-03	1.609e-02	Auger electron
2.28780e-02	1.688e-01	Conversion electron
4.45280e-02	1.050e-02	Auger electron
7.71150e-02	1.800e-02	Conversion electron
7.75970e-02	2.555e-01	Conversion electron
7.88017e-02	2.444e-01	Conversion electron
8.62610e-02	1.297e-01	Conversion electron
8.83600e-02	3.512e-02	Conversion electron
1.36348e-01	1.266e-01	Conversion electron
1.90585e-01	1.429e-02	Conversion electron
1.91067e-01	3.267e-02	Conversion electron
1.92272e-01	2.329e-02	Conversion electron
1.99731e-01	1.727e-02	Conversion electron
2.41358e-01	4.855e-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