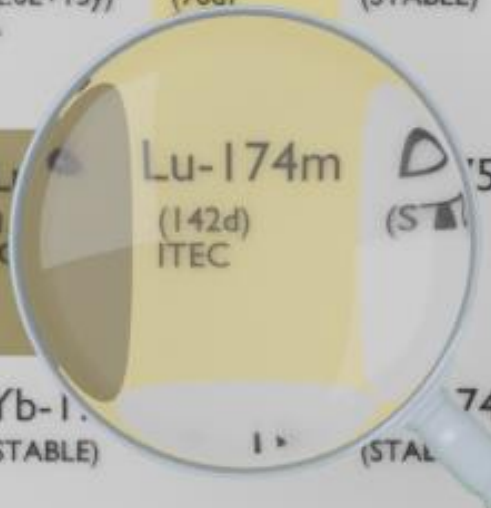




Lu-170 (1.012d) EC+	Lu-171 (8.24d) ECB+	Lu-172 (6.70d) ECB+	Lu-174m (142d) ITEC	Lu-175 (8.02d) EC	Lu-176 (3.85E+10y) B-	Lu-177 (6.647d) B-	Lu-178 (28.4m) B-
Yb-169 (32.026d) EC	Yb-170 (STABLE)	Yb-171 (STABLE)	Yb-174 (STABLE)	Yb-175 (4.185d) B-	Yb-176 (STABLE)	Yb-177 (1.911h) B-	Yb-178 (STABLE)

LUTETIUM-174M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Lu-174m
Atomic number (Z): 71
Mass number (A): 174
Neutron number (N): 103

RADIOACTIVE DECAY

Decay modes: Electron capture, Internal transition
Half-life: 142.0 [d]
Decay constant: 5.6497×10^{-8} [1/s]
Daughters: Lu-174 (99.4%), Yb-174 (0.62%)
Radioactive daughters: Lu-174

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.1188 [MeV]
Mean photon energy: 0.0626 [MeV]
Air kerma rate constant, Γ_{10} : 4.329×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 4.329×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.903×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

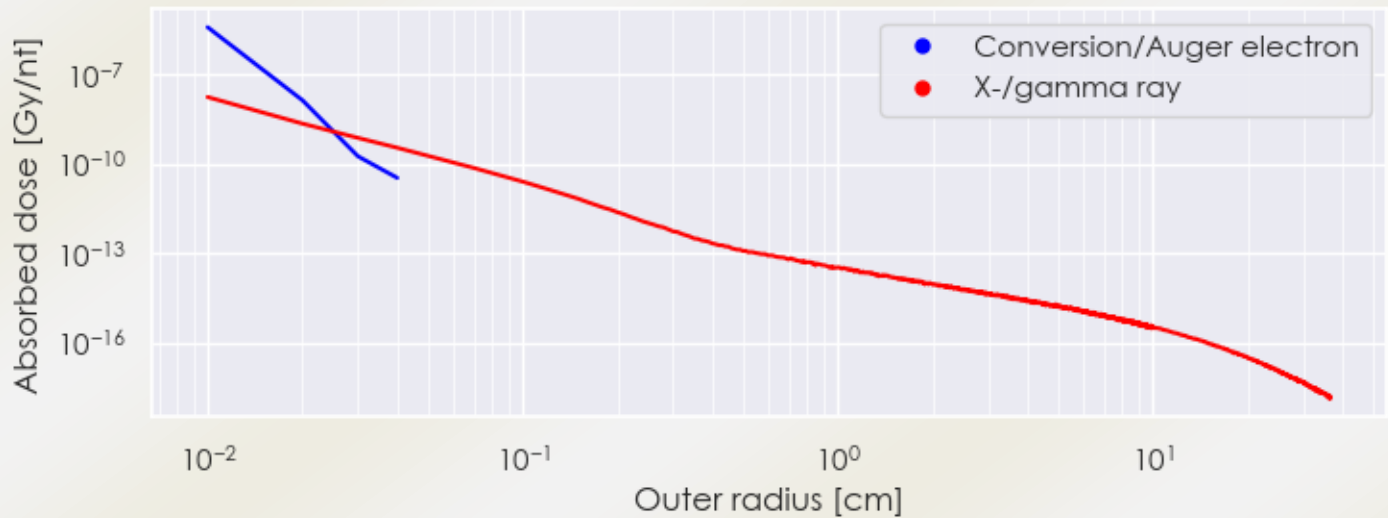
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 1.903×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.003×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

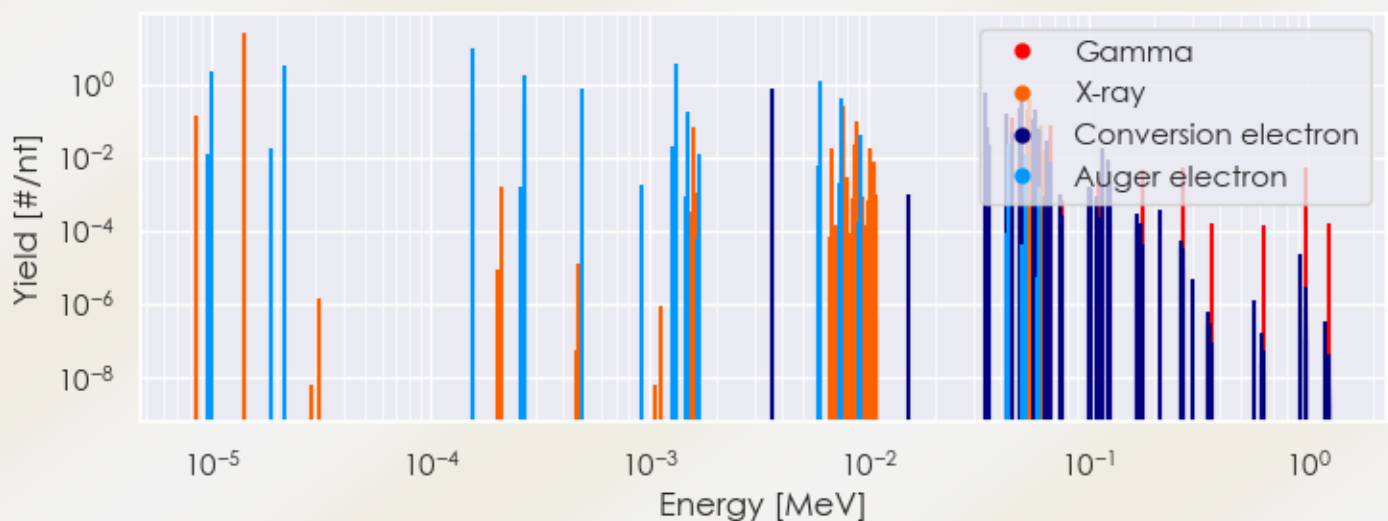
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Lu-174m 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-174m 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/Lu-174m Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Lu-174m%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [#]/nt] if > 0.01	Radiation type
8.56644e-06	1.370e-01	X-ray
1.39731e-05	2.577e+01	X-ray
1.56979e-03	6.941e-02	X-ray
6.77270e-03	1.736e-02	X-ray
7.59238e-03	2.823e-02	X-ray
7.64541e-03	2.493e-01	X-ray
8.58698e-03	2.177e-02	X-ray
8.72221e-03	9.396e-02	X-ray
8.82888e-03	2.846e-02	X-ray
9.04388e-03	4.290e-02	X-ray
1.01636e-02	1.691e-02	X-ray
4.46830e-02	1.243e-01	Gamma
5.30692e-02	2.018e-01	X-ray
5.41988e-02	3.543e-01	X-ray
6.11839e-02	3.755e-02	X-ray
6.14258e-02	7.254e-02	X-ray
6.30870e-02	1.623e-02	X-ray
6.70580e-02	7.249e-02	Gamma
9.52165e-06	1.235e-02	Auger electron
1.00912e-05	2.269e+00	Auger electron
1.88631e-05	1.732e-02	Auger electron
2.16371e-05	3.202e+00	Auger electron
1.54497e-04	4.955e-02	Auger electron
1.56371e-04	9.184e+00	Auger electron
2.67699e-04	1.696e+00	Auger electron
2.69165e-04	2.826e-01	Auger electron
4.94356e-04	7.254e-01	Auger electron

1.26222e-03	1.887e-02	Auger electron
1.30887e-03	3.790e+00	Auger electron
1.48570e-03	1.826e-01	Auger electron
1.69254e-03	1.184e-02	Auger electron
3.61601e-03	7.324e-01	Conversion electron
5.96369e-03	1.157e+00	Auger electron
7.52293e-03	4.227e-01	Auger electron
9.11463e-03	3.921e-02	Auger electron
3.38380e-02	5.834e-01	Conversion electron
3.43100e-02	6.606e-02	Conversion electron
3.54398e-02	2.201e-02	Conversion electron
4.26669e-02	1.519e-01	Conversion electron
4.32341e-02	2.333e-02	Auger electron
4.46830e-02	4.345e-02	Conversion electron
4.82350e-02	2.153e-01	Conversion electron
4.87070e-02	2.755e-02	Conversion electron
4.98368e-02	4.638e-01	Conversion electron
5.15128e-02	1.200e-02	Auger electron
5.62130e-02	1.027e-01	Conversion electron
5.66850e-02	1.272e-02	Conversion electron
5.70639e-02	2.034e-01	Conversion electron
5.90800e-02	5.709e-02	Conversion electron
6.50419e-02	2.736e-02	Conversion electron
1.15827e-01	1.694e-02	Conversion electron
1.16957e-01	1.181e-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