



Lu-169 (4.06h) EC+	Lu-170 (2.012d) ECB+	Lu-171 (8.24d) ECB+	Lu-172 (1.87y) EC	Lu-173 (1.37y) EC	Lu-174 (2.0E+15y) EC	Lu-175 (70d) EC	Lu-176 (STABLE)	Lu-177 (STABLE)	Lu-178 (STABLE)
Yb-168 (STABLE)	Yb-169 (32.026d) EC	Yb-170 (STABLE)	Yb-171 (STABLE)	Yb-172 (STABLE)	Yb-173 (STABLE)	Yb-174 (STABLE)	Yb-175 (4.185d) B-	Yb-176 (STABLE)	Yb-177 (STABLE)

LUTETIUM-173

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Lu-173
Atomic number (Z): 71
Mass number (A): 173
Neutron number (N): 102

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 1.37 [y]
Decay constant: $1.6033\text{e-}08$ [1/s]
Daughters: Yb-173 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.05259 [MeV]
Mean photon energy: 0.18342 [MeV]
Air kerma rate constant, Γ_{10} : $7.533\text{e-}18$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Air kerma coefficient, K_{air} : $7.533\text{e-}18$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $8.426\text{e-}15$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]

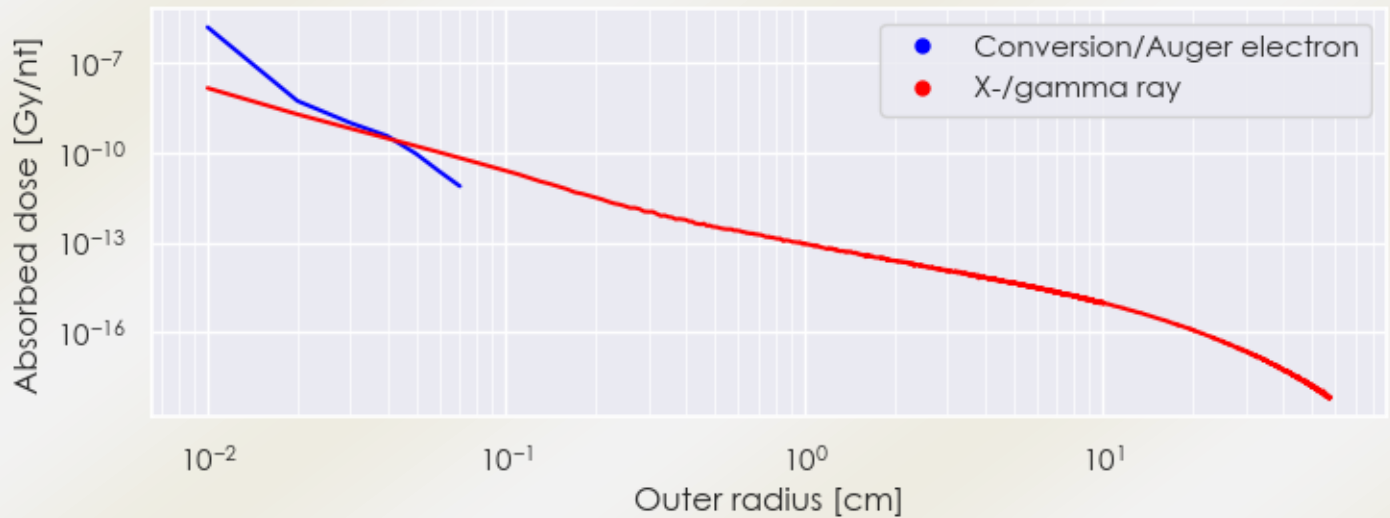
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 8.426×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.939×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

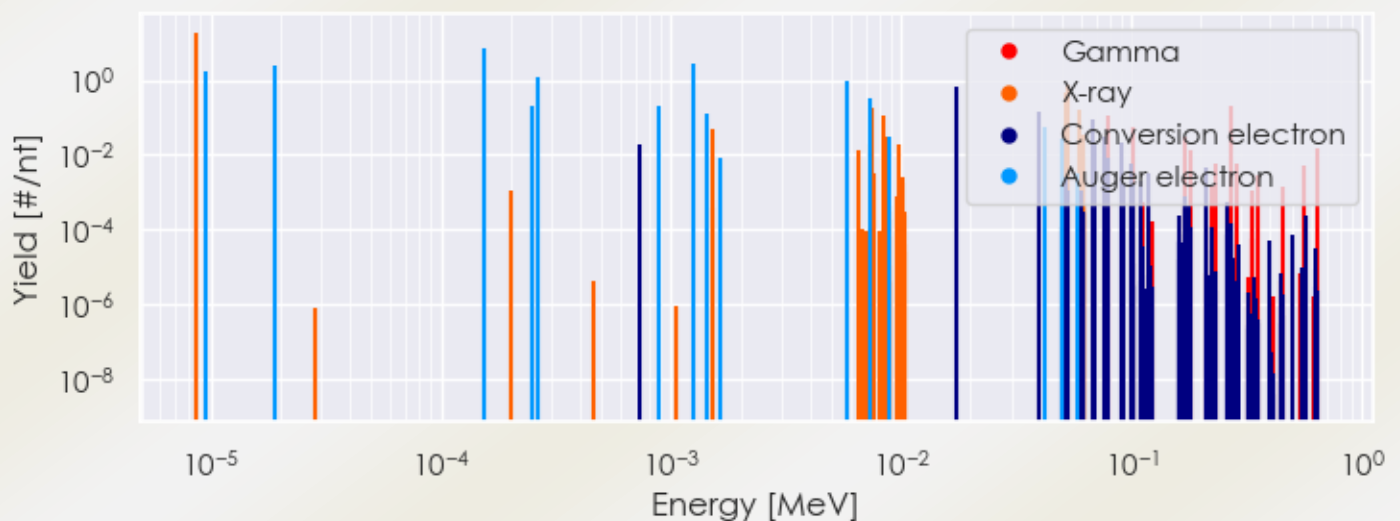
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Lu-173 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-173 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-173 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Lu-173%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [#/(nt)] if > 0.01	Radiation type
8.63377e-06	1.918e+01	X-ray
1.50151e-03	4.730e-02	X-ray
6.56570e-03	1.256e-02	X-ray
7.35570e-03	2.006e-02	X-ray
7.40530e-03	1.770e-01	X-ray
8.41451e-03	1.127e-01	X-ray
8.74938e-03	3.022e-02	X-ray
9.79888e-03	2.008e-02	X-ray
5.14483e-02	4.429e-01	X-ray
5.25072e-02	7.805e-01	X-ray
5.92804e-02	8.226e-02	X-ray
5.95058e-02	1.589e-01	X-ray
6.10550e-02	1.830e-02	X-ray
6.11060e-02	3.539e-02	X-ray
7.86300e-02	1.187e-01	Gamma
1.00724e-01	5.236e-02	Gamma
1.71393e-01	2.904e-02	Gamma
1.79365e-01	1.376e-02	Gamma
2.72105e-01	2.120e-01	Gamma
6.36110e-01	1.452e-02	Gamma
9.42952e-06	1.677e+00	Auger electron
1.88617e-05	2.378e+00	Auger electron
1.54785e-04	6.936e+00	Auger electron
2.46730e-04	2.101e-01	Auger electron
2.61241e-04	1.214e+00	Auger electron
7.29002e-04	1.827e-02	Conversion electron
8.86338e-04	1.943e-01	Auger electron

1.25656e-03	2.804e+00	Auger electron
1.42921e-03	1.265e-01	Auger electron
5.80912e-03	9.233e-01	Auger electron
7.30141e-03	3.328e-01	Auger electron
8.82424e-03	3.053e-02	Auger electron
1.71890e-02	6.715e-01	Conversion electron
3.92830e-02	1.463e-01	Conversion electron
4.19611e-02	5.345e-02	Auger electron
4.99512e-02	2.732e-02	Auger electron
6.81760e-02	9.339e-02	Conversion electron
6.86374e-02	2.265e-02	Conversion electron
6.96962e-02	1.579e-02	Conversion electron
7.66948e-02	3.028e-02	Conversion electron
9.02700e-02	2.029e-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