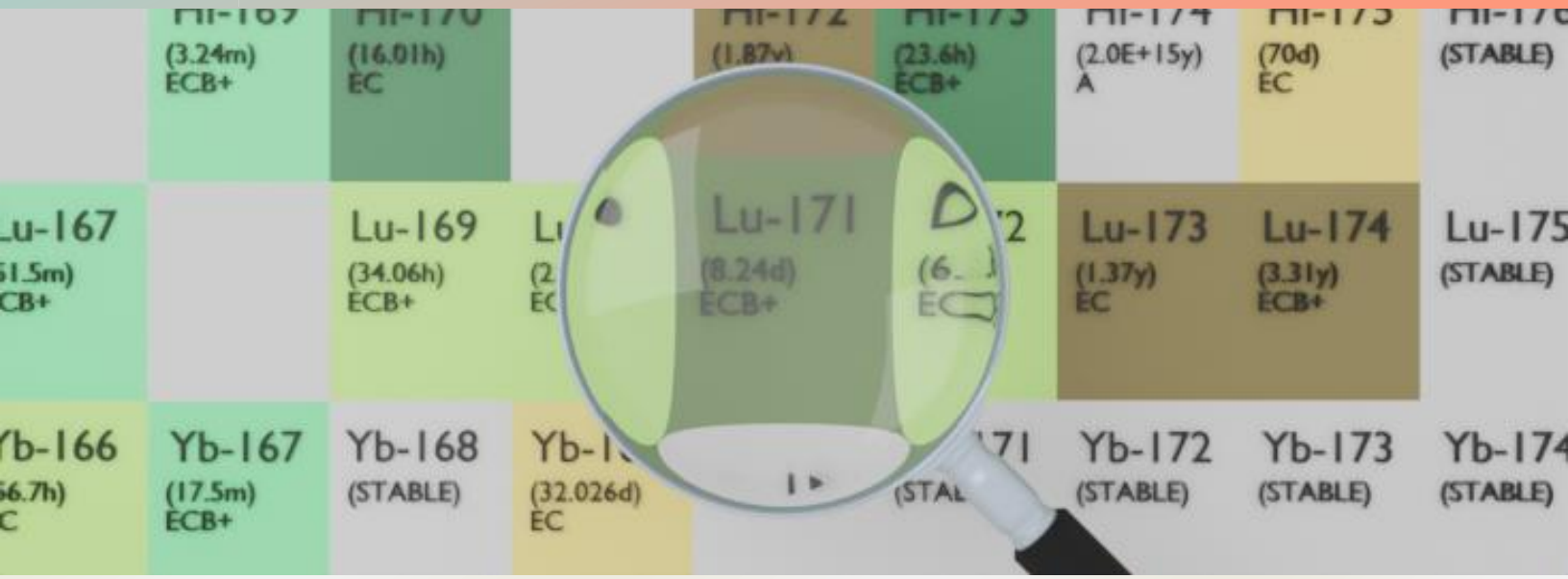


LUTETIUM-171

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Lu-171
Atomic number (Z): 71
Mass number (A): 171
Neutron number (N): 100

RADIOACTIVE DECAY

Decay modes: β+, Electron capture
Half-life: 8.24 [d]
Decay constant: 9.7361e-07 [1/s]
Daughters: Yb-171 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

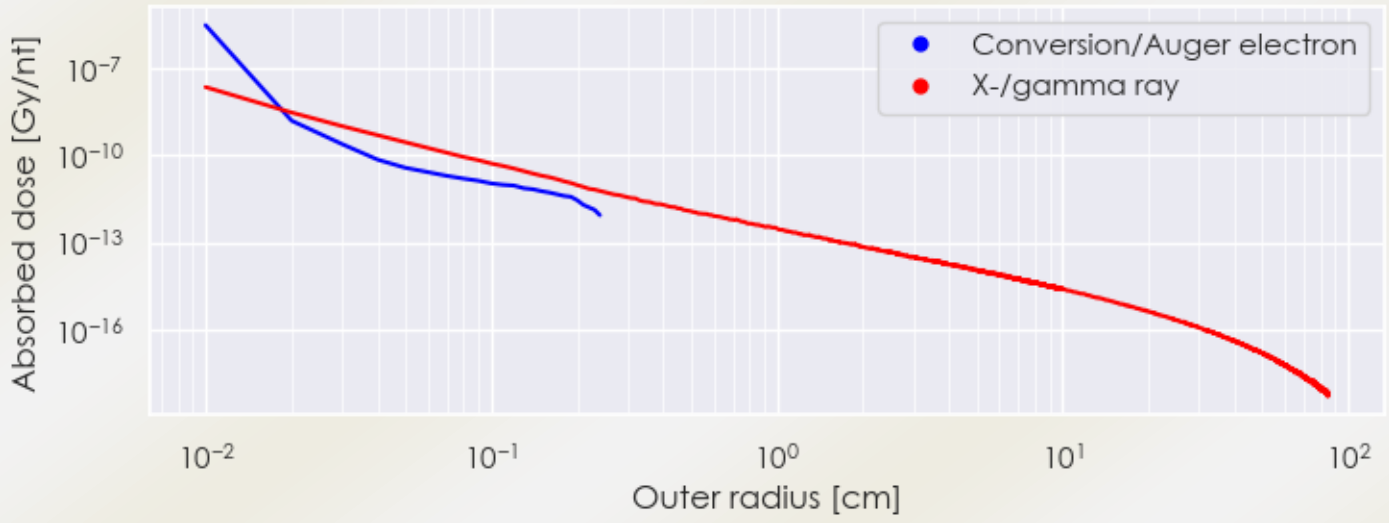
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.09278 [MeV]
Mean photon energy: 0.65032 [MeV]
Air kerma rate constant, Γ_{10}: 2.684e-17 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 2.684e-17 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 1.487e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}: 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 1.487e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 1.042e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

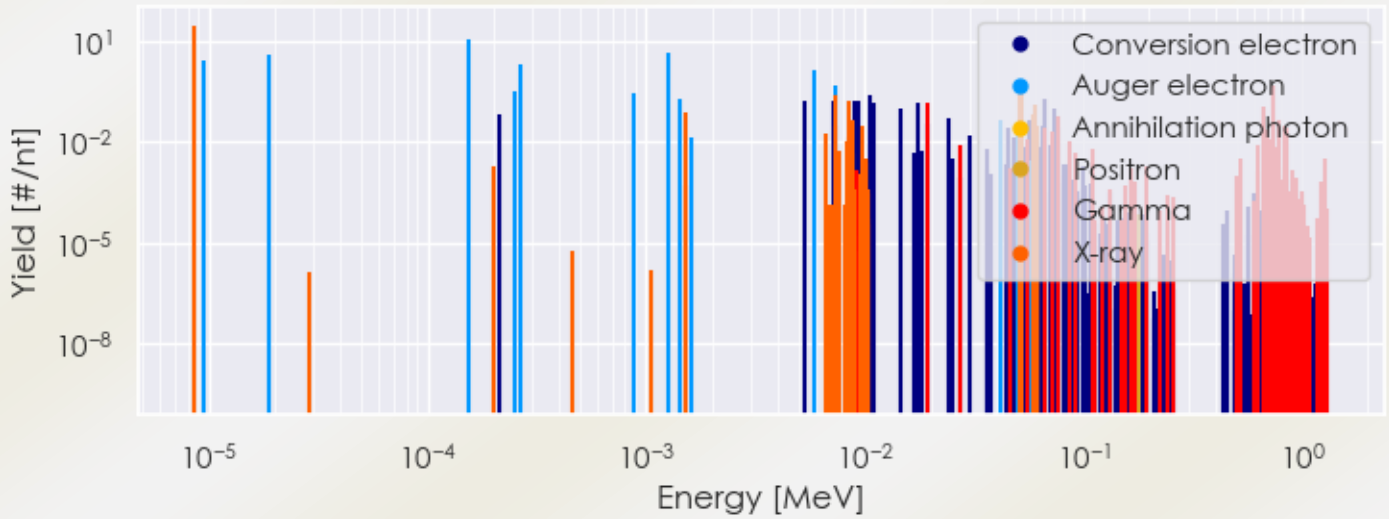
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Lu-171 DPK.csv

SUMMARY SPECTRA (PLOT)

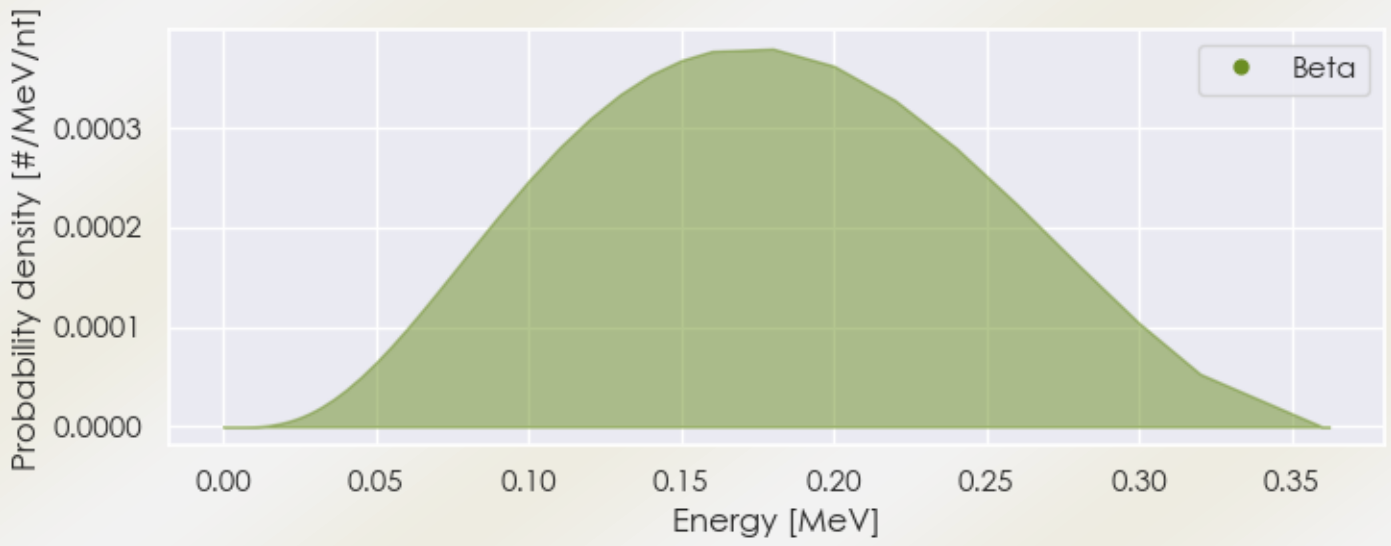
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Lu-171 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-171 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-171 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
8.63234e-06	3.001e+01	X-ray
1.50374e-03	7.292e-02	X-ray
6.56570e-03	1.830e-02	X-ray
7.35569e-03	2.922e-02	X-ray
7.40529e-03	2.579e-01	X-ray
8.41451e-03	1.759e-01	X-ray
8.51880e-03	1.322e-02	X-ray
8.74936e-03	4.403e-02	X-ray
9.79888e-03	3.134e-02	X-ray
1.93940e-02	1.375e-01	Gamma

5.14483e-02	3.550e-01	X-ray
5.25072e-02	6.257e-01	X-ray
5.56890e-02	1.221e-02	Gamma
5.92804e-02	6.594e-02	X-ray
5.95058e-02	1.274e-01	X-ray
6.10550e-02	1.467e-02	X-ray
6.11060e-02	2.837e-02	X-ray
6.67310e-02	2.476e-02	Gamma
7.23800e-02	1.997e-02	Gamma
7.58890e-02	6.093e-02	Gamma
8.56020e-02	1.083e-02	Gamma
6.67422e-01	1.106e-01	Gamma
6.89286e-01	2.371e-02	Gamma
7.12670e-01	1.135e-02	Gamma
7.39793e-01	4.790e-01	Gamma
7.80711e-01	4.368e-02	Gamma
8.39961e-01	3.046e-02	Gamma
8.53091e-01	2.553e-02	Gamma
9.44641e-06	2.646e+00	Auger electron
1.88620e-05	3.739e+00	Auger electron
1.54697e-04	1.085e+01	Auger electron
2.15201e-04	6.862e-02	Conversion electron
2.49007e-04	3.342e-01	Auger electron
2.64416e-04	2.022e+00	Auger electron
8.80566e-04	2.800e-01	Auger electron
1.25929e-03	4.314e+00	Auger electron
1.43655e-03	1.964e-01	Auger electron
1.62685e-03	1.308e-02	Auger electron
5.29001e-03	1.709e-01	Conversion electron
5.81693e-03	1.365e+00	Auger electron
7.21380e-03	1.763e-01	Conversion electron
7.30932e-03	4.922e-01	Auger electron
8.83226e-03	4.515e-02	Auger electron
8.94000e-03	1.603e-01	Conversion electron
9.14900e-03	4.939e-02	Conversion electron
9.40140e-03	1.764e-01	Conversion electron
1.04602e-02	2.651e-01	Conversion electron
1.09390e-02	1.401e-01	Conversion electron

1.44480e-02	9.642e-02	Conversion electron
1.74588e-02	1.407e-01	Conversion electron
1.93940e-02	3.577e-02	Conversion electron
2.41610e-02	4.786e-02	Conversion electron
2.99670e-02	1.623e-02	Conversion electron
4.19611e-02	4.285e-02	Auger electron
4.52350e-02	2.724e-02	Conversion electron
4.78480e-02	1.322e-02	Conversion electron
4.99512e-02	2.190e-02	Auger electron
5.62770e-02	2.380e-02	Conversion electron
5.67384e-02	4.625e-02	Conversion electron
5.77972e-02	4.713e-02	Conversion electron
6.19260e-02	1.948e-02	Conversion electron
6.47958e-02	2.846e-02	Conversion electron
6.54350e-02	1.039e-02	Conversion electron
6.58964e-02	1.830e-01	Conversion electron
6.69552e-02	1.874e-01	Conversion electron
7.39538e-02	9.437e-02	Conversion electron
7.58890e-02	2.489e-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