



LANTHANUM-132

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: La-132
Atomic number (Z): 57
Mass number (A): 132
Neutron number (N): 75

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 4.8 [h]
Decay constant: $4.0113\text{e-}05$ [1/s]
Daughters: Ba-132 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.56931 [MeV]
Mean photon energy: 1.99523 [MeV]
Air kerma rate constant, Γ_{10} : $5.425\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Air kerma coefficient, K_{air} : $7.076\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $9.121\text{e-}14$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]

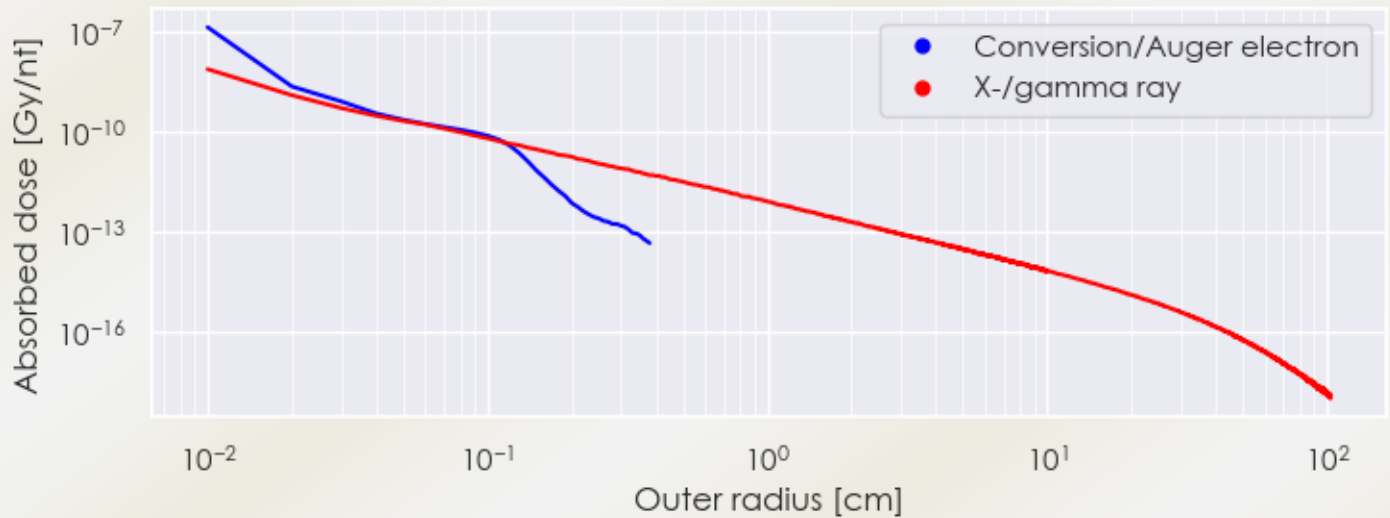
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 9.121×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.197×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

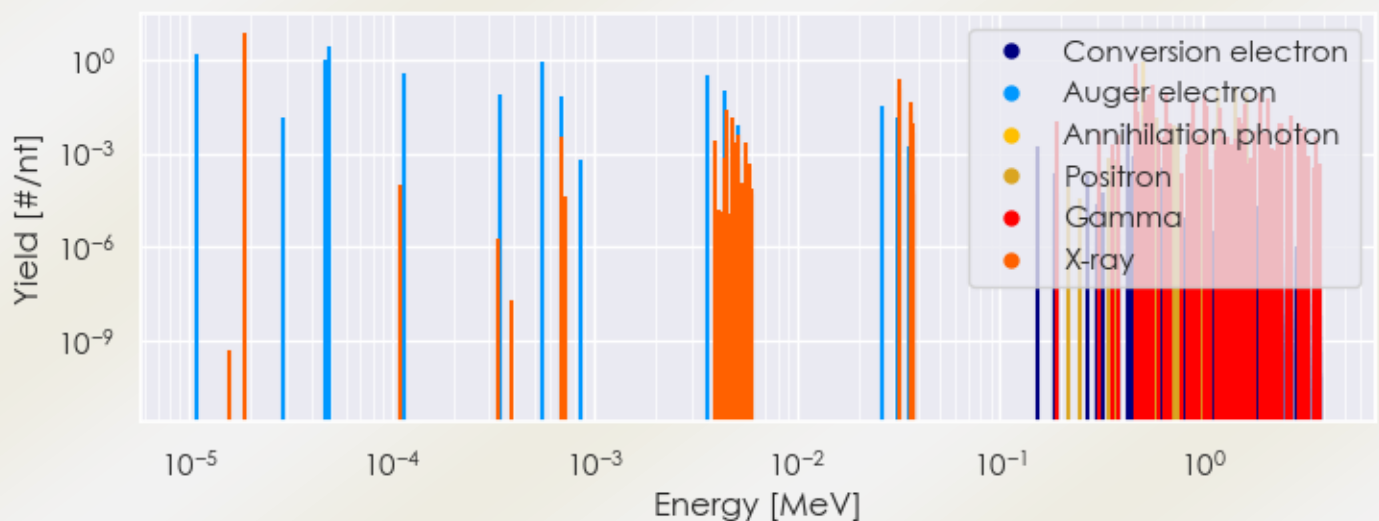
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/La-132 DPK.csv

SUMMARY SPECTRA (PLOT)

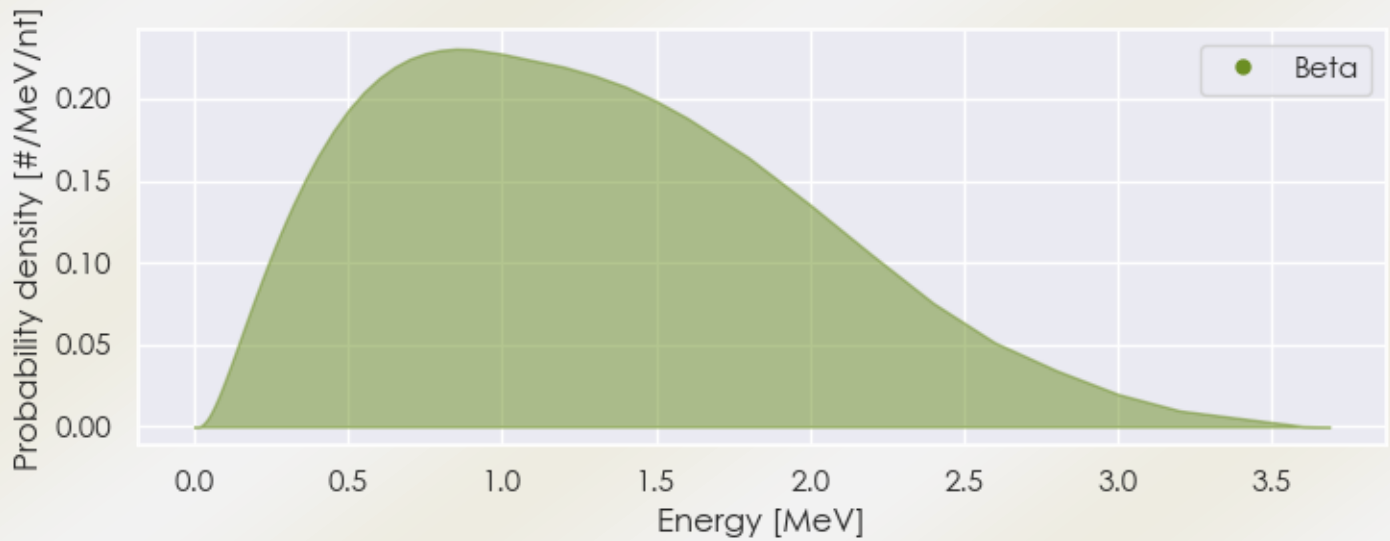
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/La-132 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/La-132 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/La-132 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.86002e-05	7.875e+00	X-ray
4.45292e-03	2.480e-02	X-ray
4.82366e-03	1.460e-02	X-ray
3.18187e-02	1.297e-01	X-ray
3.22056e-02	2.389e-01	X-ray
3.63167e-02	2.283e-02	X-ray
3.63920e-02	4.423e-02	X-ray
1.92600e-01	1.140e-02	Gamma
4.64550e-01	7.600e-01	Gamma
4.79470e-01	2.196e-02	Gamma

5.11000e-01	8.530e-01	Annihilation photon
5.15780e-01	5.016e-02	Gamma
5.40363e-01	7.676e-02	Gamma
5.67140e-01	1.573e-01	Gamma
6.63070e-01	9.044e-02	Gamma
8.99320e-01	4.636e-02	Gamma
1.03170e+00	7.752e-02	Gamma
1.04656e+00	3.405e-02	Gamma
1.22123e+00	2.934e-02	Gamma
1.53366e+00	1.474e-02	Gamma
1.53366e+00	1.474e-02	Gamma
1.60403e+00	3.648e-02	Gamma
1.90991e+00	9.044e-02	Gamma
2.10284e+00	5.852e-02	Gamma
2.75473e+00	1.596e-02	Gamma
5.05392e-01	1.714e-02	Positron
5.90870e-01	1.512e-02	Positron
1.19995e+00	1.210e-01	Positron
1.46313e+00	1.412e-01	Positron
1.67396e+00	9.276e-02	Positron
1.08630e-05	1.680e+00	Auger electron
2.91100e-05	1.393e-02	Auger electron
4.69842e-05	9.753e-01	Auger electron
4.88208e-05	2.664e+00	Auger electron
1.14465e-04	3.855e-01	Auger electron
3.42600e-04	7.844e-02	Auger electron
5.52297e-04	8.699e-01	Auger electron
6.90677e-04	6.406e-02	Auger electron
3.56945e-03	3.412e-01	Auger electron
4.33600e-03	1.091e-01	Auger electron
2.63448e-02	3.180e-02	Auger electron
3.09583e-02	1.467e-02	Auger 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