



The image shows a portion of a periodic table of radionuclides. A magnifying glass is positioned over the entry for La-137. The table includes isotopes of Cerium (Ce), Lanthanum (La), and Barium (Ba). Each entry typically shows the isotope name, its half-life, and its decay mode. The magnifying glass highlights the entry for La-137, which has a half-life of 6.0×10^4 years and decays via electron capture (EC).

Isotope	Half-life	Decay Mode
Ce-134	3.16d	EC
Ce-135	(17.7h)	ECB+
Ce-136	(STABLE)	
Ce-137	(9.0h)	ECB+
Ce-138	(STABLE)	
Ce-139	(137.641d)	EC
Ce-140	(STABLE)	
Ce-141	(32.508d)	B-
Ce-142	(STABLE)	
La-133	3.912h	CB+
La-134	(6.45m)	ECB+
La-135	(19.5h)	ECB+
La-136	(9.0h)	EC
La-137	(6.0E+4y)	EC
La-138	(1.0E+4y)	EC
La-139	(STABLE)	
La-140	(1.6781d)	B-
La-141	(3.92h)	B-
Ba-132	(STABLE)	
Ba-133	(10.52y)	EC
Ba-134	(STABLE)	
Ba-135	(STABLE)	
Ba-136	(STABLE)	
Ba-137	(STABLE)	
Ba-138	(STABLE)	
Ba-139	(83.06m)	B-
Ba-140	(12.752d)	B-

LANTHANUM-137

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: La-137
Atomic number (Z): 57
Mass number (A): 137
Neutron number (N): 80

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 60000.0 [y]
Decay constant: 3.6608×10^{-13} [1/s]
Daughters: Ba-137 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.00648 [MeV]
Mean photon energy: 0.02502 [MeV]
Air kerma rate constant, Γ_{10} : 3.666×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.666×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.038×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

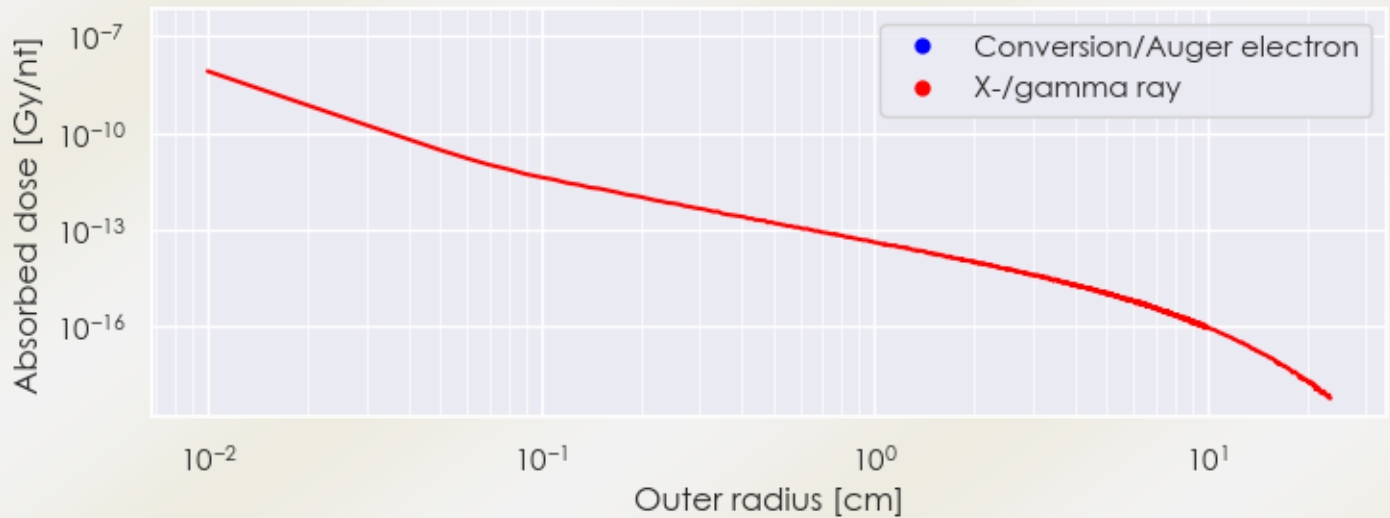
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.038e-15 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.009e-15 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

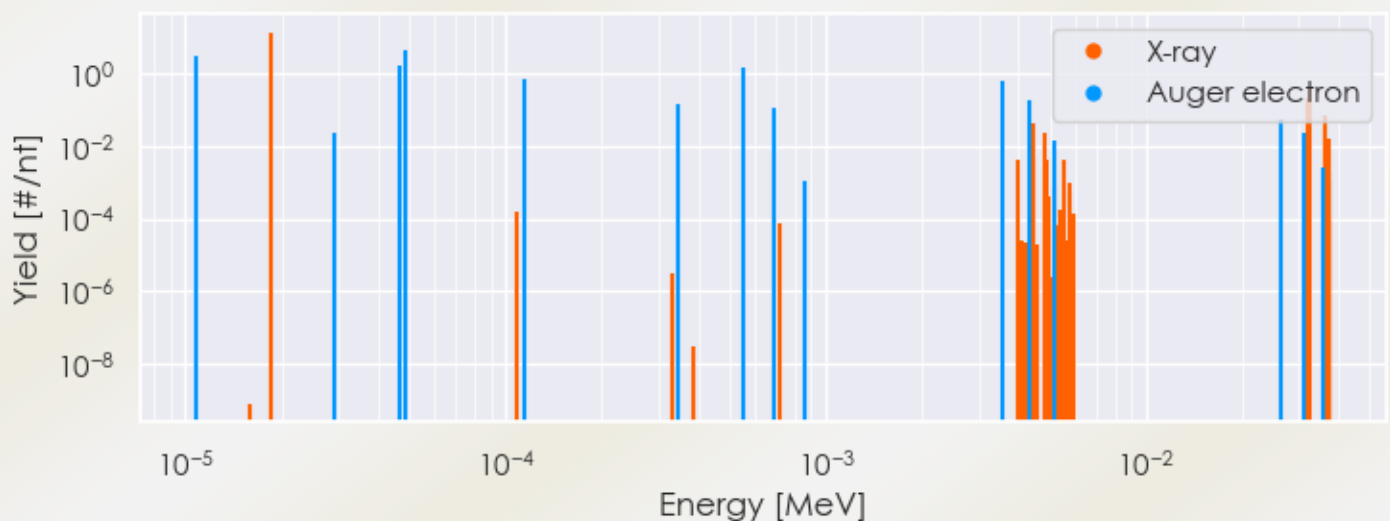
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/La-137 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-137 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/La-137 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/La-137%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [#/(nt)] if > 0.01	Radiation type
1.85994e-05	1.338e+01	X-ray
4.45292e-03	4.156e-02	X-ray
4.82366e-03	2.428e-02	X-ray
3.18187e-02	2.119e-01	X-ray
3.22056e-02	3.902e-01	X-ray
3.63167e-02	3.730e-02	X-ray
3.63920e-02	7.226e-02	X-ray
3.72607e-02	1.535e-02	X-ray
1.08630e-05	2.856e+00	Auger electron
2.91100e-05	2.367e-02	Auger electron
4.69964e-05	1.662e+00	Auger electron
4.88385e-05	4.526e+00	Auger electron
1.14428e-04	6.599e-01	Auger electron
3.47540e-04	1.413e-01	Auger electron
5.52520e-04	1.472e+00	Auger electron
6.91243e-04	1.085e-01	Auger electron
3.57310e-03	5.766e-01	Auger electron
4.34019e-03	1.843e-01	Auger electron
5.13793e-03	1.441e-02	Auger electron
2.63448e-02	5.196e-02	Auger electron
3.09583e-02	2.397e-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