



CERIUM-132

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ce-132
Atomic number (Z): 58
Mass number (A): 132
Neutron number (N): 74

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 3.51 [h]
Decay constant: 5.4855×10^{-5} [1/s]
Daughters: La-132 (100.0%)
Radioactive daughters: La-132

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.01804 [MeV]
Mean photon energy: 0.27272 [MeV]
Air kerma rate constant, Γ_{10} : 1.223×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.223×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.890×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

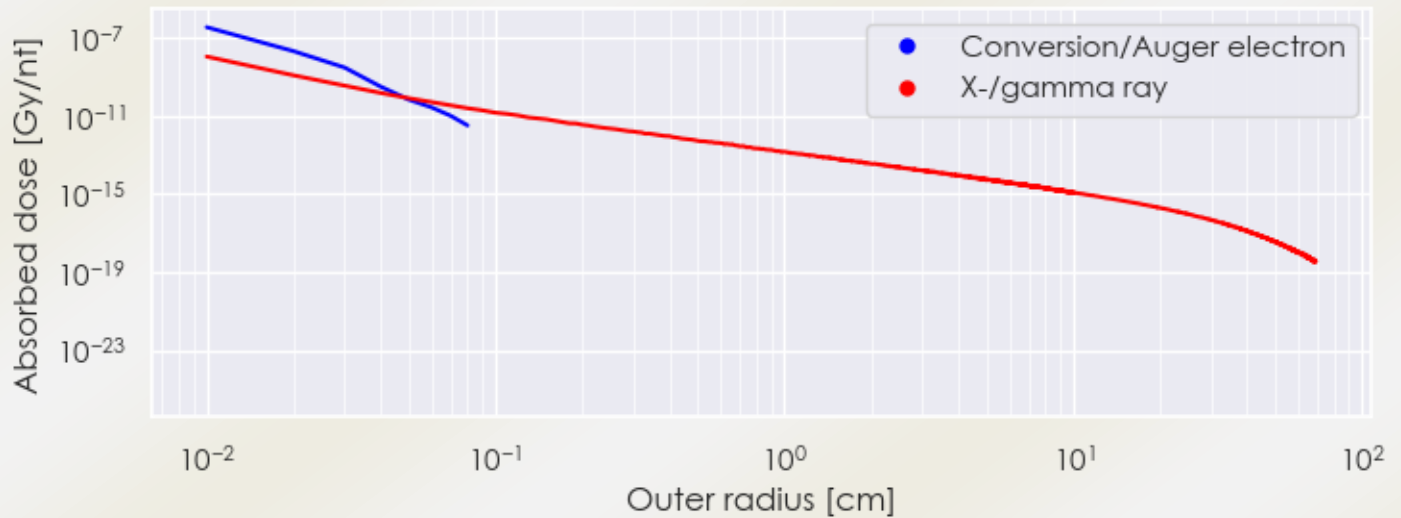
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta+, e-}$: 2.890e-15 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.369e-14 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

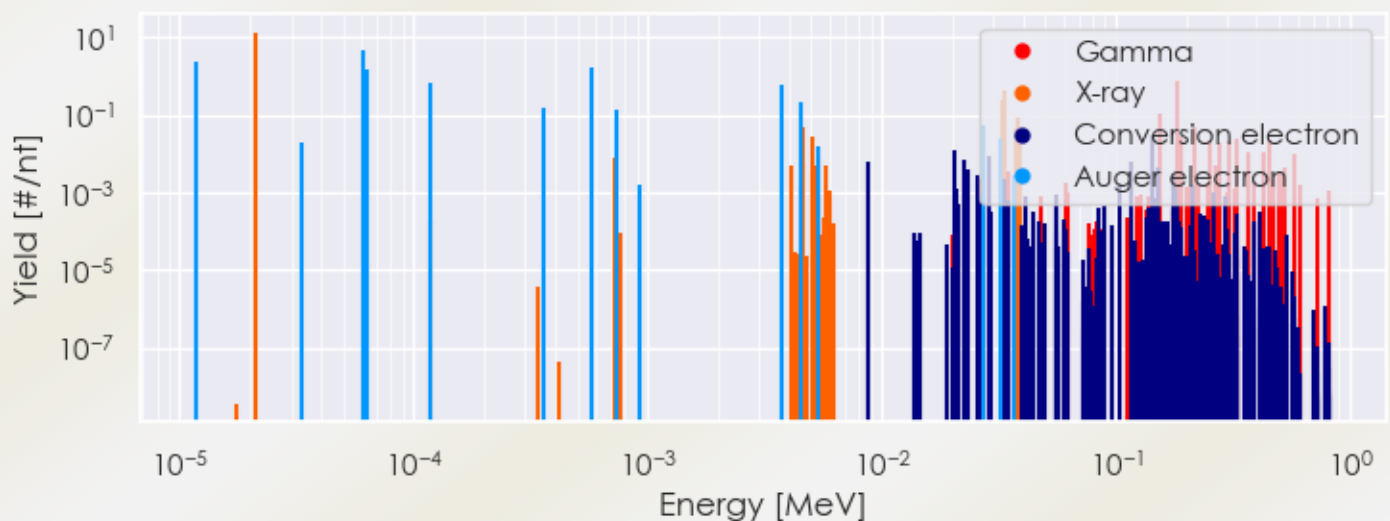
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ce-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/Ce-132 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/Ce-132 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Ce-132%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / n ^t] if > 0.01	Radiation type
2.10713e-05	1.374e+01	X-ray
4.63652e-03	4.855e-02	X-ray
5.03753e-03	2.894e-02	X-ray
3.30405e-02	2.377e-01	X-ray
3.34591e-02	4.365e-01	X-ray
3.77381e-02	4.207e-02	X-ray
3.78202e-02	8.150e-02	X-ray
3.87359e-02	1.738e-02	X-ray
1.55370e-01	1.053e-01	Gamma
1.82110e-01	7.740e-01	Gamma
1.90040e-01	2.670e-02	Gamma
2.16830e-01	4.954e-02	Gamma
2.51460e-01	2.245e-02	Gamma
2.79120e-01	1.935e-02	Gamma
3.03120e-01	2.090e-02	Gamma
3.29640e-01	2.322e-02	Gamma
3.68510e-01	1.130e-02	Gamma
4.24670e-01	1.161e-02	Gamma
4.51440e-01	2.245e-02	Gamma
5.76380e-01	1.006e-02	Gamma
1.18532e-05	2.402e+00	Auger electron
3.33700e-05	1.979e-02	Auger electron
6.07463e-05	4.781e+00	Auger electron
6.28974e-05	1.522e+00	Auger electron
1.17693e-04	6.827e-01	Auger electron
3.61477e-04	1.578e-01	Auger electron
5.79836e-04	1.597e+00	Auger electron

7.30716e-04	1.379e-01	Auger electron
3.70216e-03	6.272e-01	Auger electron
4.51653e-03	2.075e-01	Auger electron
5.36270e-03	1.632e-02	Auger electron
2.04082e-02	1.218e-02	Conversion electron
2.73123e-02	5.460e-02	Auger electron
3.21336e-02	2.555e-02	Auger electron
1.43167e-01	3.002e-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