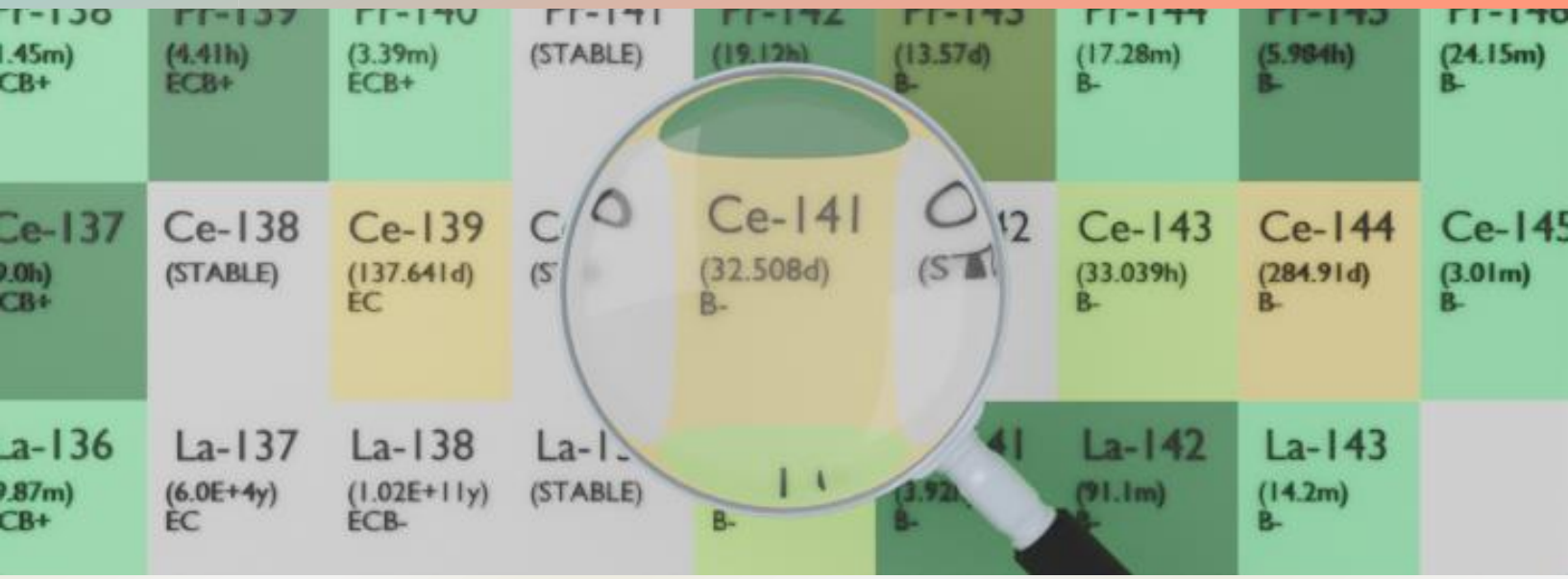


CERIUM-141

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ce-141
Atomic number (Z): 58
Mass number (A): 141
Neutron number (N): 83

RADIOACTIVE DECAY

Decay modes: β-
Half-life: 32.51 [d]
Decay constant: 2.4679e-07 [1/s]
Daughters: Pr-141 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

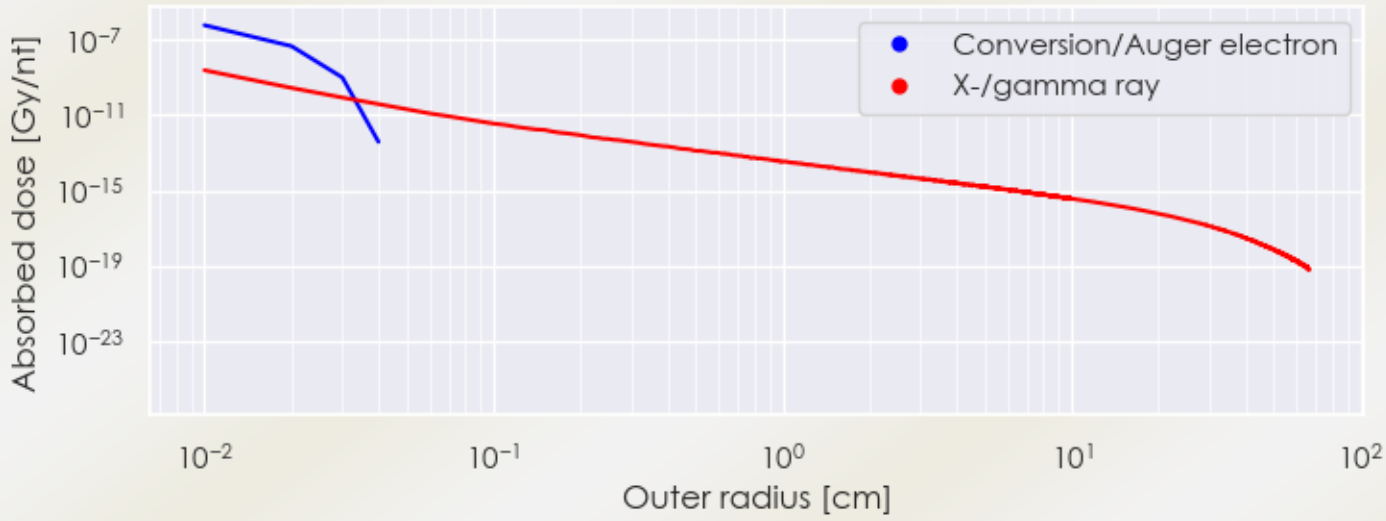
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.17103 [MeV]
Mean photon energy: 0.0768 [MeV]
Air kerma rate constant, Γ_{10}: 2.919e-18 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 2.919e-18 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 2.740e-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, $\Delta_{\beta-,\beta+,e-}$: 2.740e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 1.230e-14 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

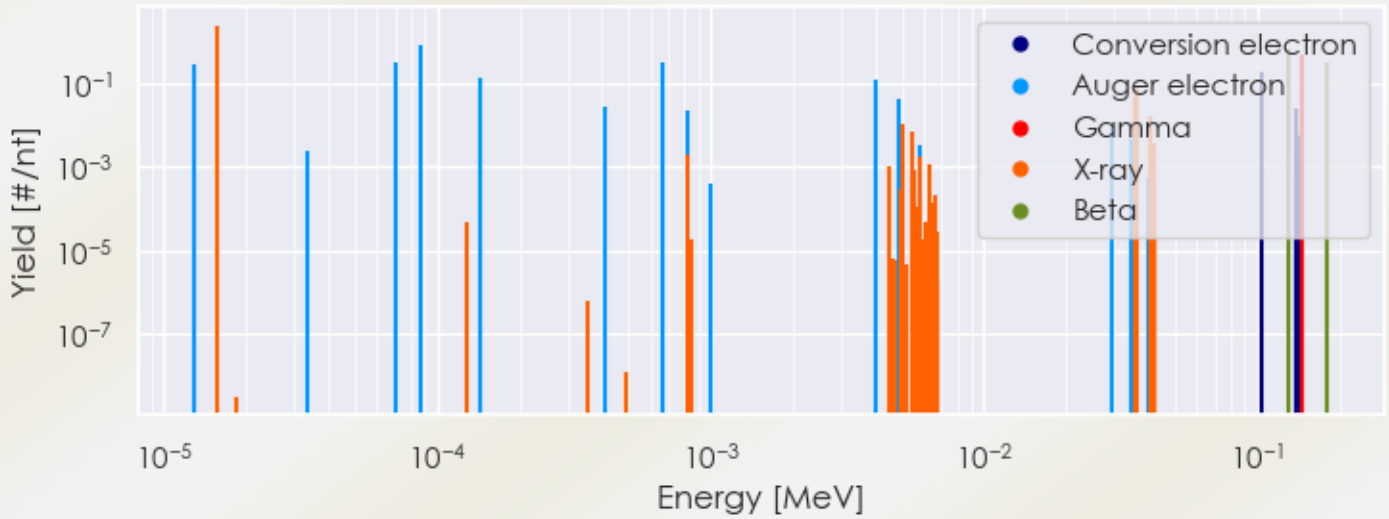
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ce-141 DPK.csv

SUMMARY SPECTRA (PLOT)

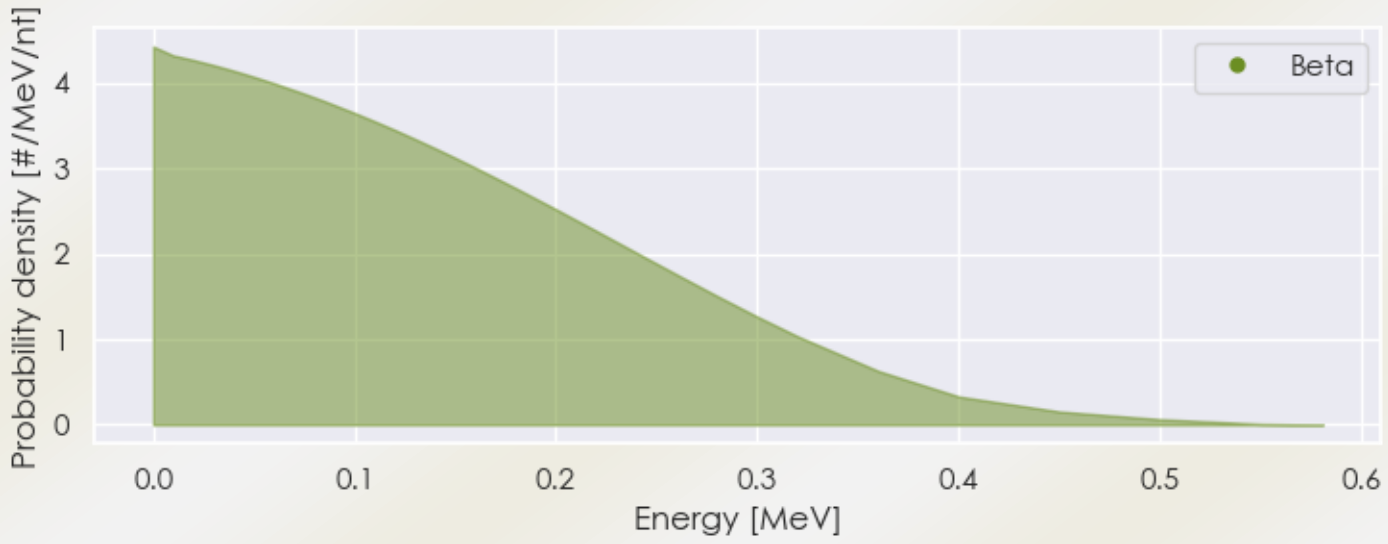
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ce-141 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/Ce-141 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/Ce-141 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
1.56194e-05	2.460e+00	X-ray
5.01953e-03	1.101e-02	X-ray
3.55671e-02	4.969e-02	X-ray
3.60557e-02	9.074e-02	X-ray
4.07816e-02	1.722e-02	X-ray
1.45443e-01	4.829e-01	Gamma
1.29792e-01	6.970e-01	Beta
1.80864e-01	3.030e-01	Beta
1.29601e-05	2.875e-01	Auger electron
7.04272e-05	3.073e-01	Auger electron

8.72057e-05	8.639e-01	Auger electron
1.42950e-04	1.361e-01	Auger electron
4.13460e-04	2.830e-02	Auger electron
6.67514e-04	3.187e-01	Auger electron
8.25515e-04	2.254e-02	Auger electron
3.99570e-03	1.222e-01	Auger electron
4.89880e-03	4.067e-02	Auger electron
2.93378e-02	1.012e-02	Auger electron
1.03433e-01	1.889e-01	Conversion electron
1.38644e-01	2.392e-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