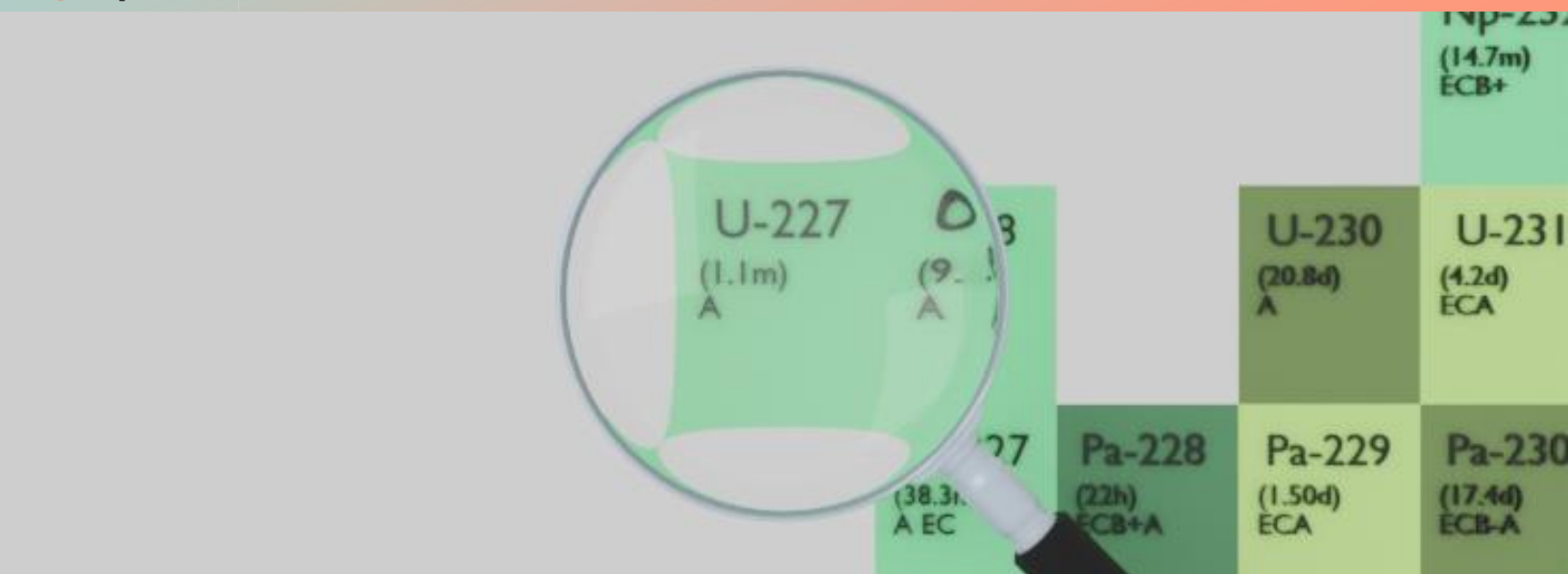




URANIUM-227

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: U-227
Atomic number (Z): 92
Mass number (A): 227
Neutron number (N): 135

RADIOACTIVE DECAY

Decay modes: α
Half-life: 1.1 [m]
Decay constant: $1.0502\text{e-}02$ [1/s]
Daughters: Th-223 (100.0%)
Radioactive daughters: Th-223

DOSIMETRIC CONSTANTS

Mean alpha energy: 6.9978 [MeV]
Mean electron energy: 0.09604 [MeV]
Mean photon energy: 0.11986 [MeV]
Air kerma rate constant, Γ_{10} : $1.278\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $1.278\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $1.137\text{e-}12$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $1.121\text{e-}12$ [Gy $\cdot$ kg/Bq $\cdot$ s]

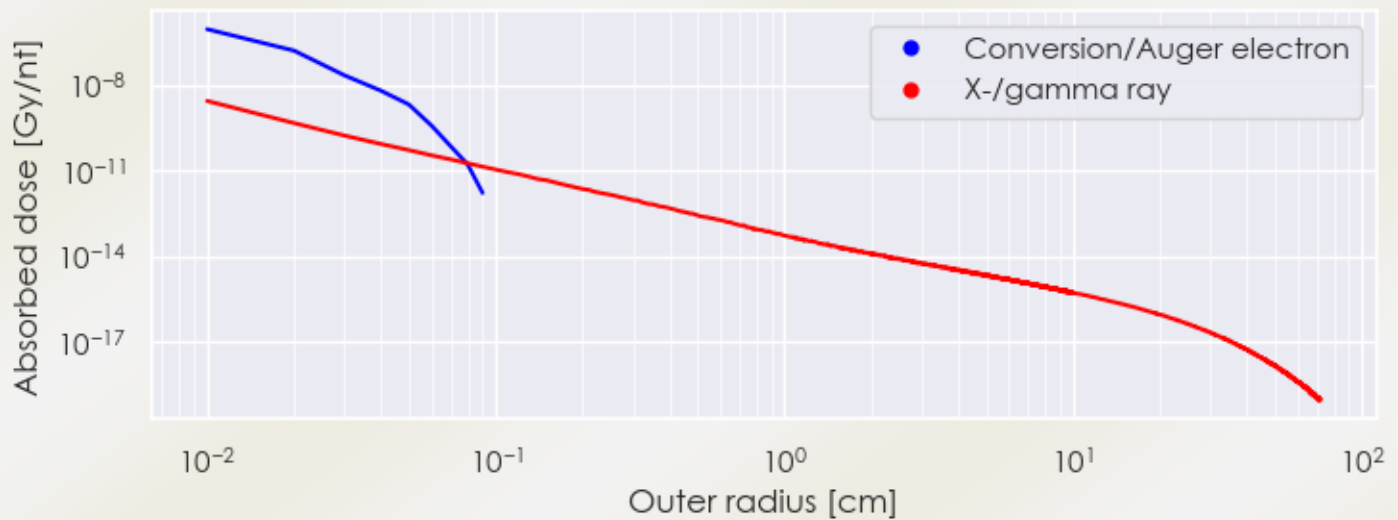
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 1.539×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.920×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

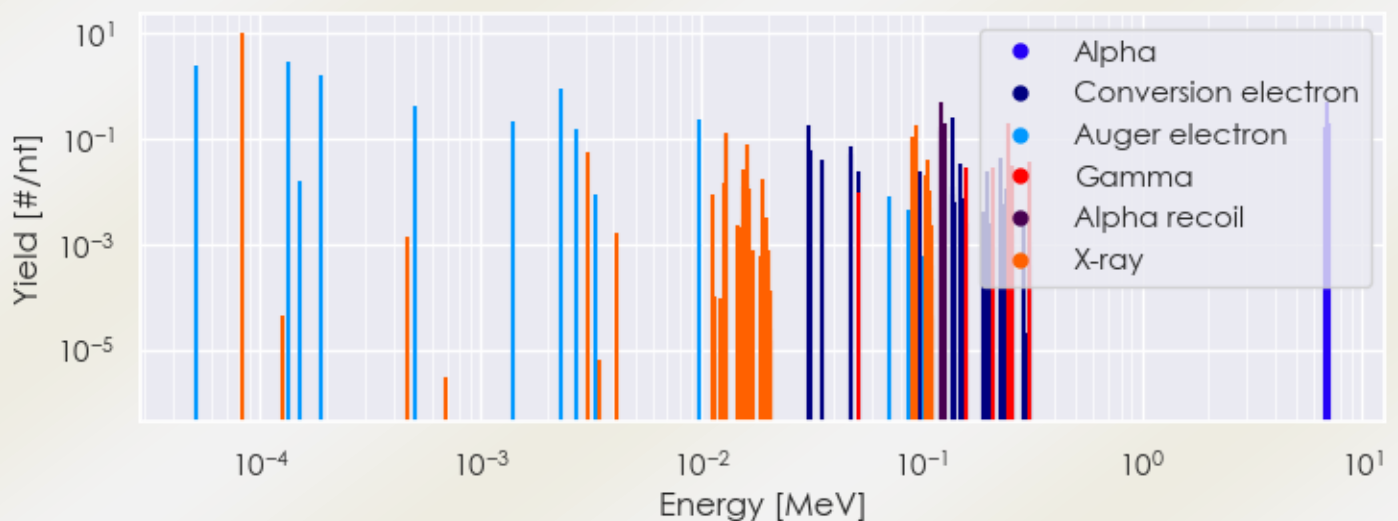
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/U-227 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/U-227 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/U-227 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/U-227%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [#/(nt)] if > 0.01	Radiation type
8.22445e-05	1.030e+01	X-ray
3.06231e-03	5.688e-02	X-ray
1.28126e-02	1.437e-02	X-ray
1.29764e-02	1.263e-01	X-ray
1.56384e-02	2.610e-02	X-ray
1.56464e-02	1.187e-02	X-ray
1.62776e-02	7.924e-02	X-ray
1.64418e-02	1.088e-02	X-ray
1.90652e-02	1.761e-02	X-ray
9.03299e-02	1.089e-01	X-ray
9.37949e-02	1.760e-01	X-ray
1.05278e-01	2.017e-02	X-ray
1.06073e-01	3.934e-02	X-ray
1.09154e-01	1.005e-02	X-ray
1.58000e-01	2.800e-02	Gamma
2.09000e-01	2.800e-02	Gamma
2.47000e-01	2.000e-01	Gamma
2.59000e-01	3.000e-02	Gamma
3.10000e-01	3.600e-02	Gamma
5.13188e-05	2.484e+00	Auger electron
1.32836e-04	2.743e+00	Auger electron
1.50455e-04	1.579e-02	Auger electron
1.88254e-04	1.549e+00	Auger electron
5.04905e-04	4.147e-01	Auger electron
1.40410e-03	2.075e-01	Auger electron
2.31453e-03	8.938e-01	Auger electron
2.72829e-03	1.533e-01	Auger electron

9.78561e-03	2.263e-01	Auger electron
1.29170e-02	1.126e-01	Auger electron
1.60862e-02	1.323e-02	Auger electron
3.08220e-02	1.753e-01	Conversion electron
3.15200e-02	6.196e-02	Conversion electron
3.49850e-02	3.942e-02	Conversion electron
4.72638e-02	6.951e-02	Conversion electron
4.78900e-02	4.935e-02	Conversion electron
5.13000e-02	2.444e-02	Conversion electron
9.88900e-02	2.322e-02	Conversion electron
1.36890e-01	2.492e-01	Conversion electron
1.38220e-01	1.175e-02	Conversion electron
1.48890e-01	3.275e-02	Conversion electron
1.99890e-01	2.395e-02	Conversion electron
2.26522e-01	4.191e-02	Conversion electron
2.42964e-01	1.123e-02	Conversion electron
6.77932e+00	1.600e-01	Alpha
6.84121e+00	5.000e-01	Alpha
6.87854e+00	1.400e-01	Alpha
7.03346e+00	2.000e-01	Alpha
1.21681e-01	1.600e-01	Alpha recoil
1.22792e-01	5.000e-01	Alpha recoil
1.23462e-01	1.400e-01	Alpha recoil
1.26243e-01	2.000e-01	Alpha recoil

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