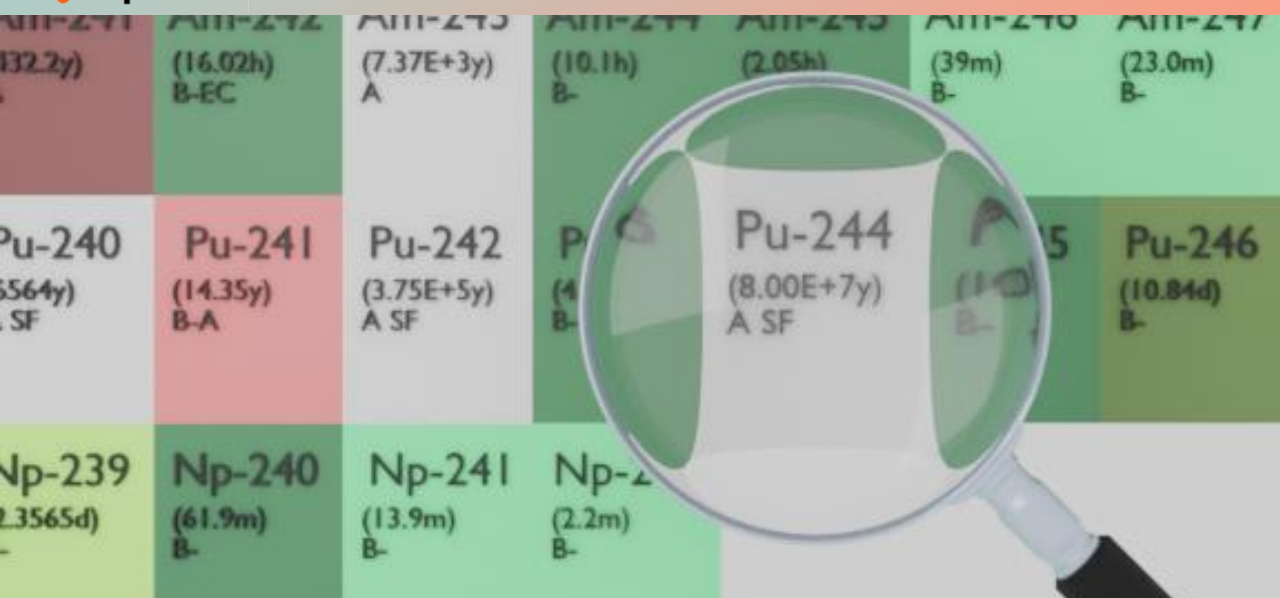




PLUTONIUM-244

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pu-244
Atomic number (Z): 94
Mass number (A): 244
Neutron number (N): 150

RADIOACTIVE DECAY

Decay modes: α , Spontaneous fission
Half-life: 80000000.0 [y]
Decay constant: $2.7456\text{e-}16$ [1/s]
Daughters: U-240 (99.9%), SF (0.121%)
Radioactive daughters: U-240

DOSIMETRIC CONSTANTS

Mean alpha energy: 4.6513 [MeV]
Mean electron energy: 0.01974 [MeV]
Mean photon energy: 0.02112 [MeV]
Air kerma rate constant, Γ_{10} : $1.760\text{e-}18$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $3.503\text{e-}18$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $7.484\text{e-}13$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $7.452\text{e-}13$ [Gy $\cdot$ kg/Bq $\cdot$ s]

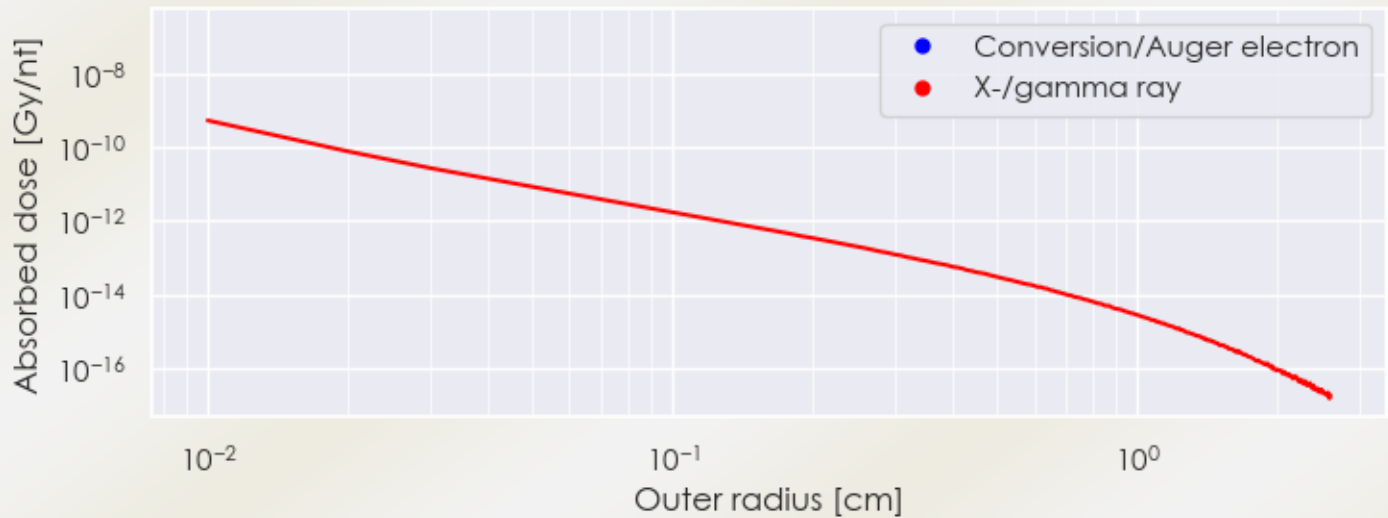
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 3.163×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.384×10^{-15} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

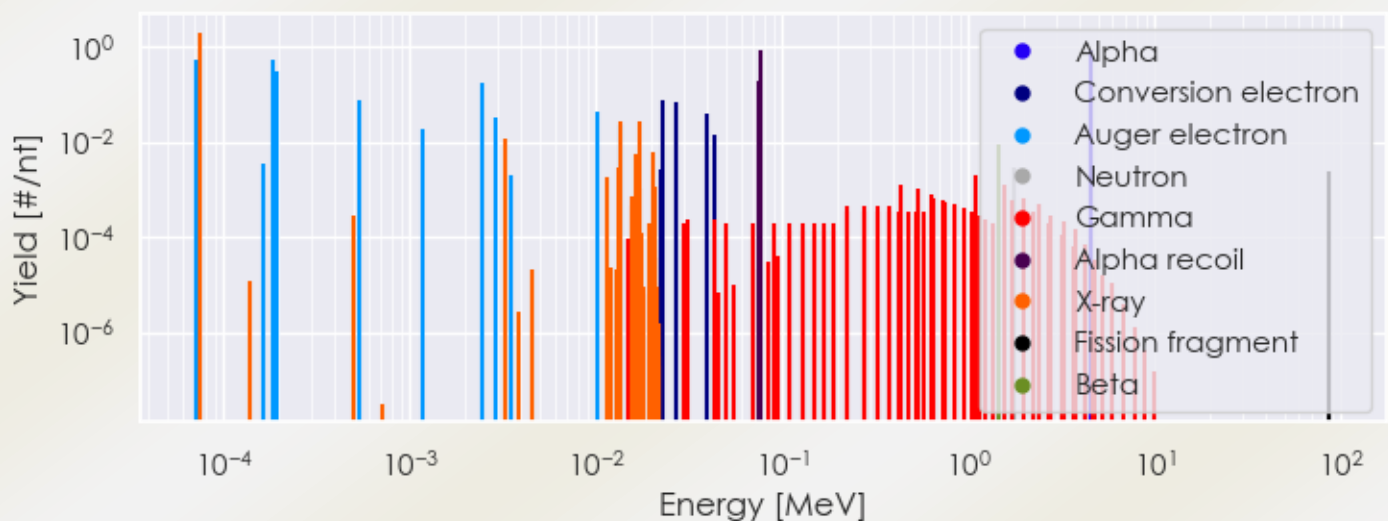
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Pu-244 DPK.csv

SUMMARY SPECTRA (PLOT)

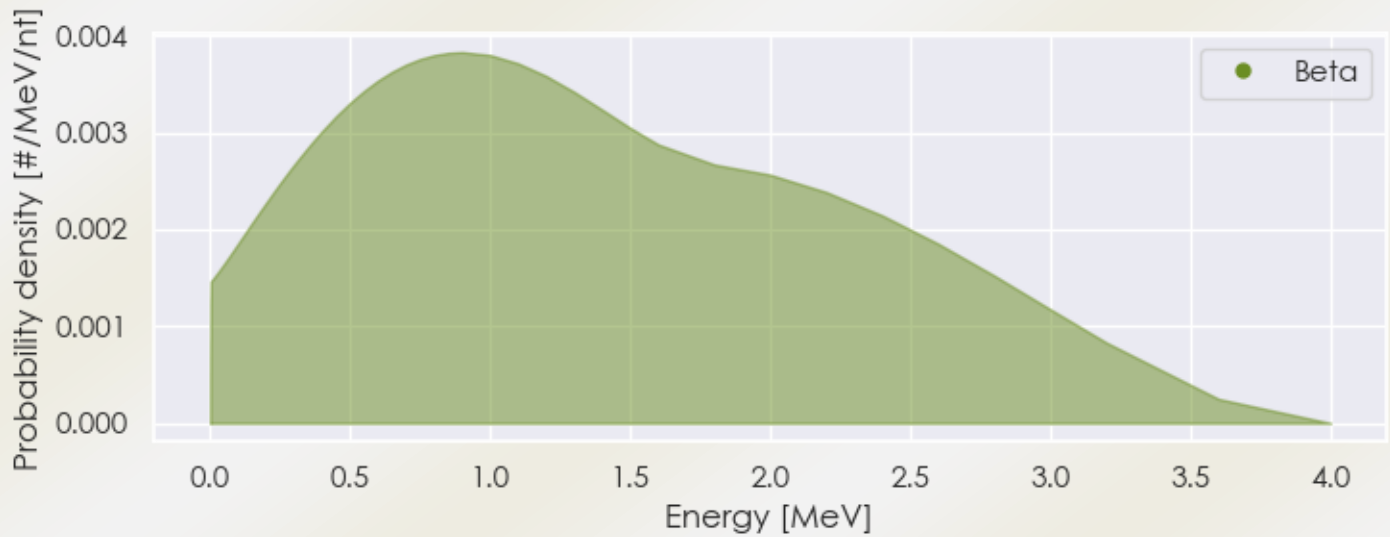
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Pu-244 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/Pu-244 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/Pu-244 Summary Spectrum.csv

Energy [MeV]	Yield [# /nt] if > 0.01	Radiation type
7.55199e-05	1.967e+00	X-ray
3.25939e-03	1.201e-02	X-ray
1.36268e-02	2.571e-02	X-ray
1.73072e-02	2.636e-02	X-ray
7.21895e-05	5.295e-01	Auger electron
1.86249e-04	5.187e-01	Auger electron
1.92414e-04	2.980e-01	Auger electron
5.38259e-04	7.620e-02	Auger electron
1.19173e-03	1.850e-02	Auger electron
2.44318e-03	1.712e-01	Auger electron

2.91569e-03	3.220e-02	Auger electron
1.02575e-02	4.313e-02	Auger electron
1.35872e-02	2.194e-02	Auger electron
2.29560e-02	7.333e-02	Conversion electron
2.68180e-02	6.507e-02	Conversion electron
3.97104e-02	3.894e-02	Conversion electron
4.40000e-02	1.370e-02	Conversion electron
4.54569e+00	1.938e-01	Alpha
4.58897e+00	8.050e-01	Alpha
7.58107e-02	1.938e-01	Alpha recoil
7.65325e-02	8.050e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6