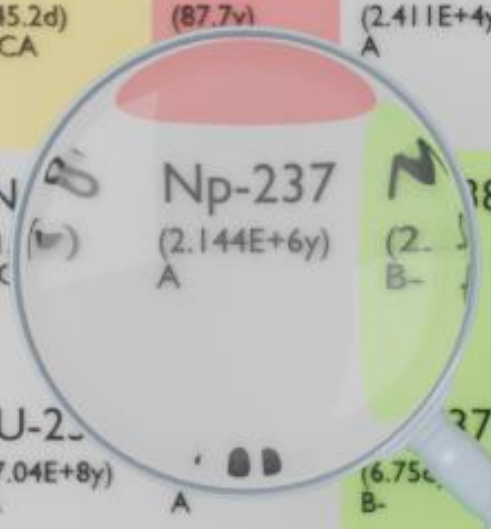




U-234 (2.45E+5y) A	U-235 (7.04E+8y) A	U-236 (2.34E+7y) A	U-237 (4.7E+8y) A	U-238 (4.468E+9y) A SF	U-239 (23.45m) B-	U-240 (14.1h) B-
Np-233 (3.62m) CA	Np-234 (4.4d) ECB+	Np-235 (396.1d) ECA	Np-236 (1.15E+6y) A	Np-237 (2.144E+6y) A	Np-238 (2.11E+4y) A	Np-239 (2.3565d) B-
Am-241 (4.32E+8y) A	Am-242m (14.1h) B-	Am-242 (16.02h) B-	Am-243 (7.37E+5y) A	Am-244 (10.1h) B-	Am-245 (1.5E+6y) A	Am-246 (2.3E+5y) A

NEPTUNIUM-237

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Np-237
Atomic number (Z): 93
Mass number (A): 237
Neutron number (N): 144

RADIOACTIVE DECAY

Decay modes: α
Half-life: 2144000.0 [y]
Decay constant: $1.0245\text{e-}14$ [1/s]
Daughters: Pa-233 (100.0%)
Radioactive daughters: Pa-233

DOSIMETRIC CONSTANTS

Mean alpha energy: 4.8493 [MeV]
Mean electron energy: 0.0681 [MeV]
Mean photon energy: 0.03495 [MeV]
Air kerma rate constant, Γ_{10} : $1.553\text{e-}17$ [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : $1.553\text{e-}17$ [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $7.879\text{e-}13$ [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : $7.769\text{e-}13$ [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-\beta+,e-}$: 1.091×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.600×10^{-15} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

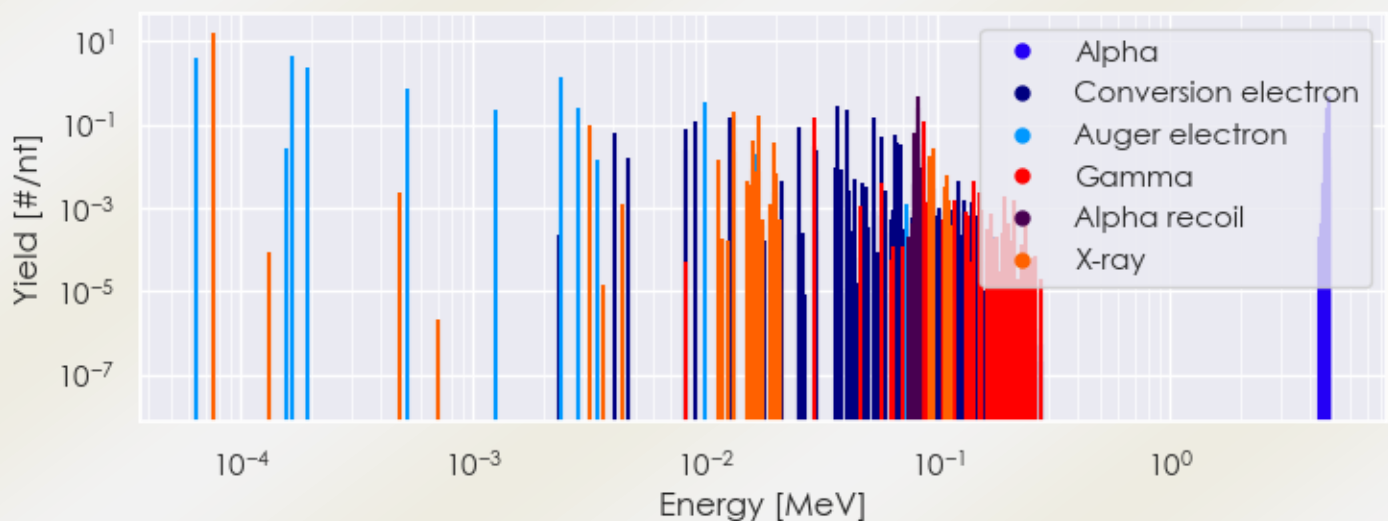
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Np-237 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/Np-237 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/Np-237 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Np-237%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
7.65371e-05	1.653e+01	X-ray
3.16304e-03	9.550e-02	X-ray
1.14081e-02	1.402e-02	X-ray
1.31269e-02	2.312e-02	X-ray
1.32994e-02	2.032e-01	X-ray
1.60398e-02	4.230e-02	X-ray
1.67859e-02	1.650e-01	X-ray
1.96582e-02	3.704e-02	X-ray
2.93740e-02	1.500e-01	Gamma
8.64770e-02	1.240e-01	Gamma
9.26782e-02	1.729e-02	X-ray
9.63371e-02	2.781e-02	X-ray
6.46349e-05	4.028e+00	Auger electron
1.56249e-04	2.708e-02	Auger electron
1.65453e-04	4.372e+00	Auger electron
1.93701e-04	2.475e+00	Auger electron
5.20349e-04	7.183e-01	Auger electron
1.24611e-03	2.264e-01	Auger electron
2.38397e-03	1.426e+00	Auger electron
2.82970e-03	2.572e-01	Auger electron
3.42911e-03	1.495e-02	Auger electron
4.06060e-03	6.622e-02	Conversion electron
4.62200e-03	1.616e-02	Conversion electron
8.22000e-03	2.373e-02	Conversion electron
8.26100e-03	7.461e-02	Conversion electron
8.97200e-03	1.210e-01	Conversion electron
9.97533e-03	3.446e-01	Auger electron

1.26310e-02	1.527e-01	Conversion electron
1.31998e-02	1.733e-01	Auger electron
1.64587e-02	2.055e-02	Auger electron
2.52146e-02	8.982e-02	Conversion electron
2.93740e-02	3.001e-02	Conversion electron
3.01690e-02	2.504e-02	Conversion electron
3.67020e-02	2.728e-01	Conversion electron
4.03610e-02	2.290e-01	Conversion electron
5.29446e-02	1.412e-01	Conversion electron
5.71040e-02	4.921e-02	Conversion electron
6.53640e-02	5.996e-02	Conversion electron
6.60750e-02	3.808e-02	Conversion electron
6.97340e-02	3.526e-02	Conversion electron
8.23176e-02	3.276e-02	Conversion electron
8.64770e-02	1.126e-02	Conversion electron
4.63990e+00	6.355e-02	Alpha
4.66502e+00	3.414e-02	Alpha
4.76652e+00	8.227e-02	Alpha
4.77191e+00	2.571e-01	Alpha
4.78876e+00	4.833e-01	Alpha
4.80447e+00	1.604e-02	Alpha
4.81764e+00	2.571e-02	Alpha
7.97068e-02	6.355e-02	Alpha recoil
8.01383e-02	3.414e-02	Alpha recoil
8.18818e-02	8.227e-02	Alpha recoil
8.19744e-02	2.571e-01	Alpha recoil
8.22639e-02	4.833e-01	Alpha recoil
8.25337e-02	1.604e-02	Alpha recoil
8.27600e-02	2.571e-02	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