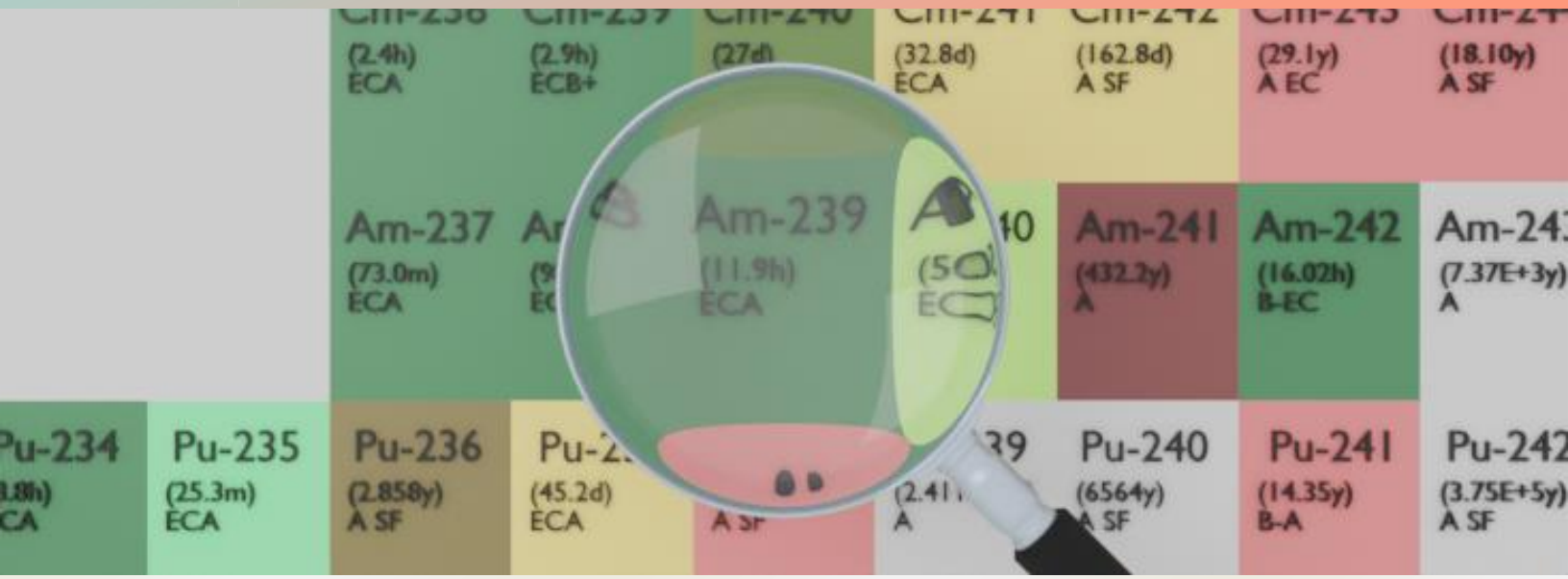


AMERICIUM-239

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Am-239
Atomic number (Z): 95
Mass number (A): 239
Neutron number (N): 144

RADIOACTIVE DECAY

Decay modes: a, Electron capture
Half-life: 11.9 [h]
Decay constant: 1.6180e-05 [1/s]
Daughters: Pu-239 (100.0%), Np-235 (0.01%)
Radioactive daughters: Pu-239, Np-235

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0005 [MeV]
Mean electron energy: 0.17087 [MeV]
Mean photon energy: 0.24355 [MeV]
Air kerma rate constant, Γ_{10}: 2.941e-17 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 2.941e-17 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 2.746e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_a: 8.011e-17 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 2.738e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 3.902e-14 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

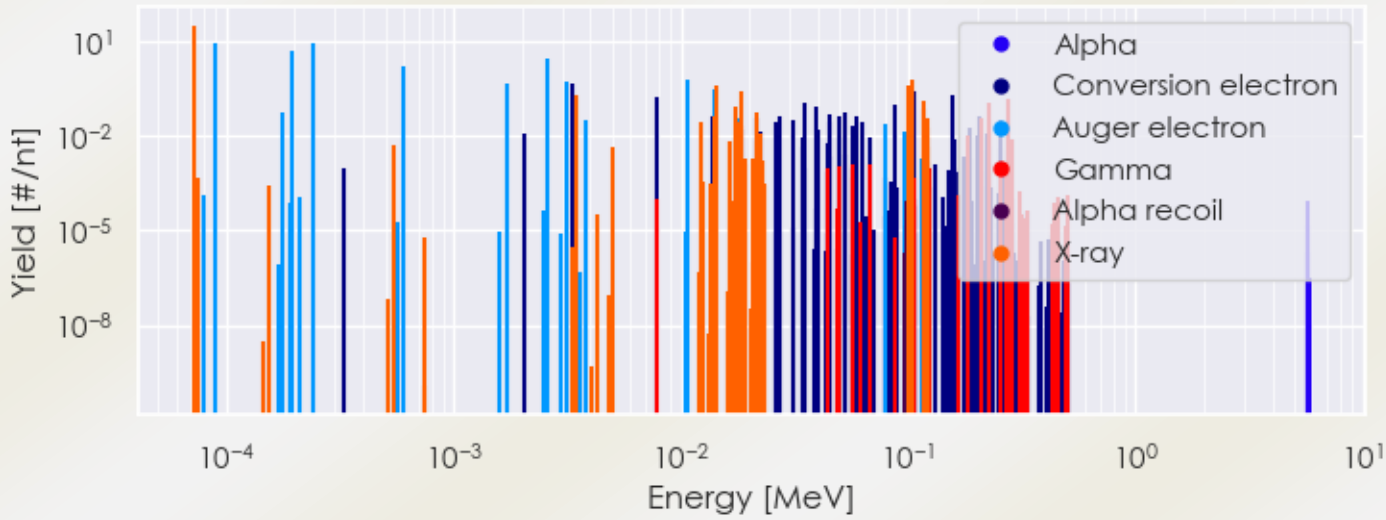
Dose point kernel source: **Graves, et al. Medical Physics. 2019 Nov.; 46(11):5284-5293.**

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/Am-239 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/Am-239 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/Am-239 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
7.19702e-05	3.328e+01	X-ray
3.45848e-03	2.076e-01	X-ray
1.21689e-02	2.824e-02	X-ray
1.40932e-02	4.489e-02	X-ray
1.42941e-02	3.942e-01	X-ray
1.72768e-02	8.386e-02	X-ray
1.75735e-02	2.639e-02	X-ray
1.79611e-02	1.633e-02	X-ray
1.83932e-02	2.580e-01	X-ray
1.85721e-02	2.169e-02	X-ray
2.15285e-02	5.953e-02	X-ray
2.22514e-02	1.190e-02	X-ray
9.99790e-02	3.857e-01	X-ray
1.04279e-01	6.106e-01	X-ray
1.16802e-01	7.080e-02	X-ray
1.17801e-01	1.389e-01	X-ray
1.20980e-01	1.784e-02	X-ray
1.21244e-01	3.636e-02	X-ray
1.81715e-01	1.080e-02	Gamma
2.09800e-01	3.500e-02	Gamma
2.26383e-01	3.300e-02	Gamma
2.28184e-01	1.130e-01	Gamma
2.77604e-01	1.500e-01	Gamma
8.90407e-05	9.196e+00	Auger electron
1.76445e-04	5.780e-02	Auger electron
1.93621e-04	5.150e+00	Auger electron
2.39543e-04	8.695e+00	Auger electron

6.04093e-04	1.650e+00	Auger electron
1.70842e-03	4.507e-01	Auger electron
2.06601e-03	1.151e-02	Conversion electron
2.56944e-03	2.722e+00	Auger electron
3.11155e-03	5.621e-01	Auger electron
3.31010e-03	4.781e-01	Conversion electron
3.78214e-03	3.405e-02	Auger electron
7.86000e-03	1.718e-01	Conversion electron
1.06191e-02	5.769e-01	Auger electron
1.38501e-02	4.315e-02	Conversion electron
1.41584e-02	2.989e-01	Auger electron
1.77355e-02	3.640e-02	Auger electron
1.84000e-02	1.573e-02	Conversion electron
2.15410e-02	3.802e-02	Conversion electron
2.22920e-02	1.411e-02	Conversion electron
2.62900e-02	2.992e-02	Conversion electron
2.70410e-02	4.255e-02	Conversion electron
3.13410e-02	3.308e-02	Conversion electron
3.49020e-02	1.117e-01	Conversion electron
3.92020e-02	8.959e-02	Conversion electron
4.01131e-02	1.555e-02	Conversion electron
4.48621e-02	2.840e-02	Conversion electron
4.54700e-02	5.269e-02	Conversion electron
4.94120e-02	1.020e-02	Conversion electron
4.97700e-02	4.011e-02	Conversion electron
5.27231e-02	5.764e-02	Conversion electron
5.72730e-02	2.058e-02	Conversion electron
5.93650e-02	4.459e-02	Conversion electron
6.32911e-02	2.664e-02	Conversion electron
7.91086e-02	2.549e-02	Auger electron
8.74500e-02	9.775e-02	Conversion electron
9.64039e-02	1.472e-02	Auger electron
1.04033e-01	5.832e-02	Conversion electron
1.05834e-01	2.491e-01	Conversion electron
1.55254e-01	1.880e-01	Conversion electron
1.86678e-01	1.725e-02	Conversion electron
2.03261e-01	1.033e-02	Conversion electron
2.05062e-01	4.374e-02	Conversion electron

2.23634e-01	1.197e-02	Conversion electron
2.54482e-01	3.287e-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