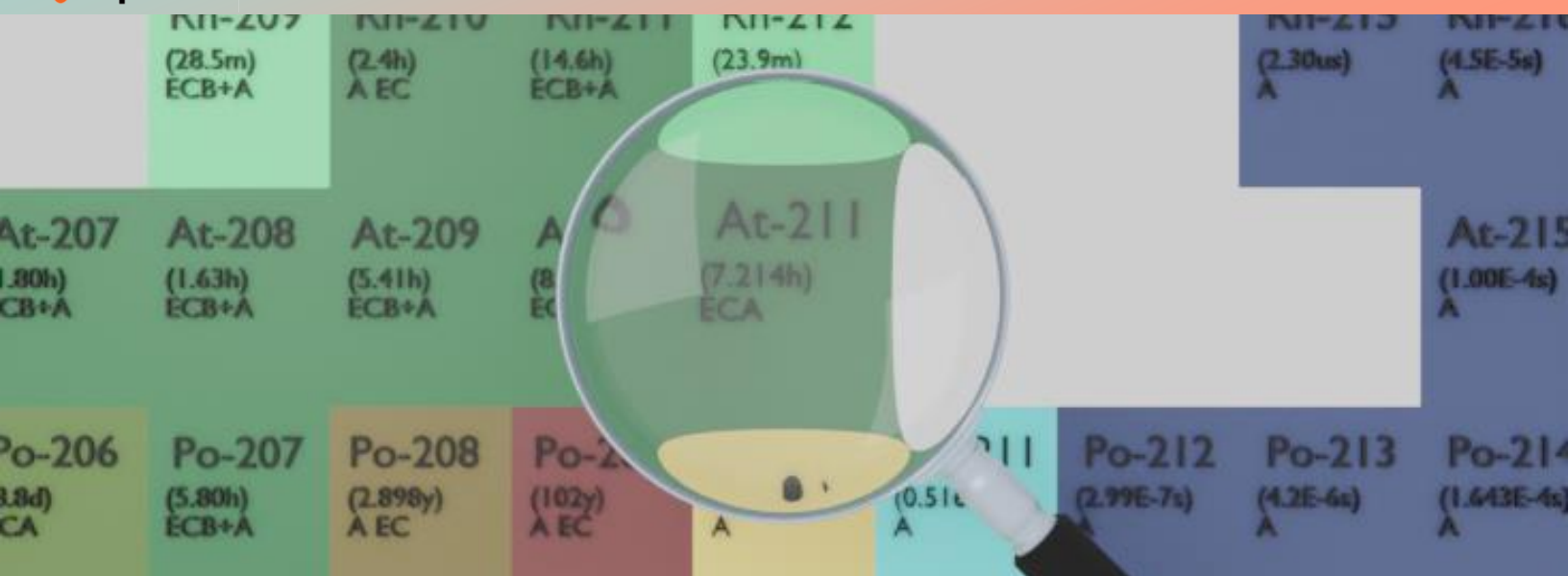




ASTATINE-211

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: At-211
Atomic number (Z): 85
Mass number (A): 211
Neutron number (N): 126

RADIOACTIVE DECAY

Decay modes: α , Electron capture
Half-life: 7.214 [h]
Decay constant: 2.6690×10^{-5} [1/s]
Daughters: Po-211 (58.2%), Bi-207 (41.8%)
Radioactive daughters: Po-211, Bi-207

DOSIMETRIC CONSTANTS

Mean alpha energy: 2.4998 [MeV]
Mean electron energy: 0.00594 [MeV]
Mean photon energy: 0.03667 [MeV]
Air kerma rate constant, Γ_{10} : 8.244×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 8.244×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 4.015×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 4.005×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta+,e-}$: 9.517×10^{-16} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.875×10^{-15} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

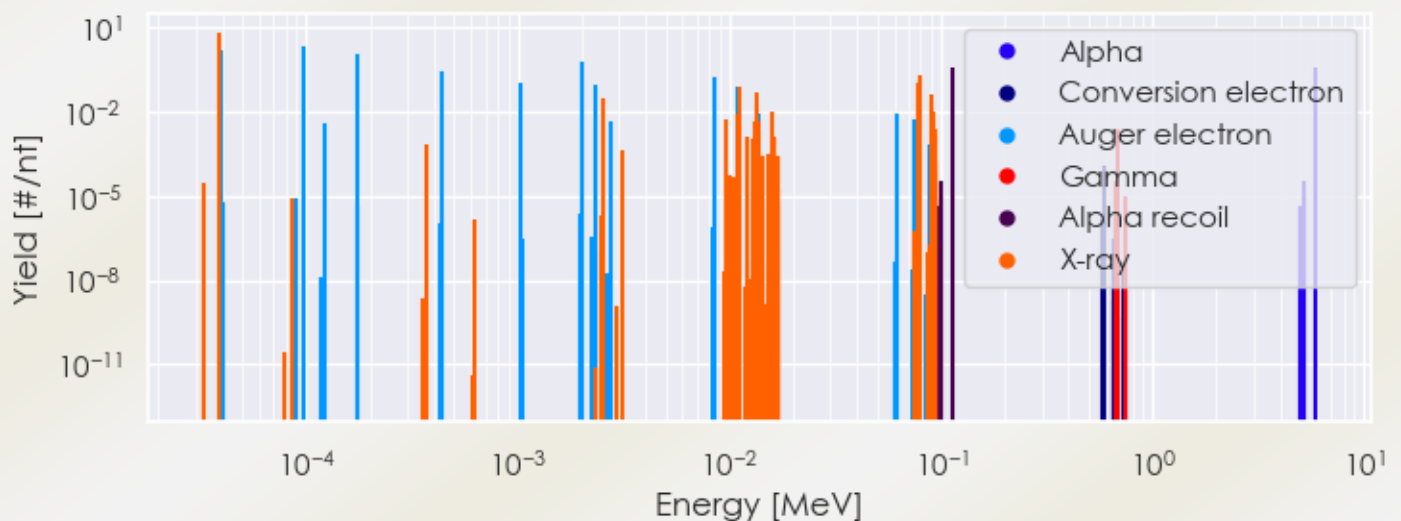
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/At-211 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/At-211 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/At-211 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/At-211%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [#/(nt)] if > 0.01	Radiation type
3.84095e-05	7.112e+00	X-ray
2.54189e-03	3.010e-02	X-ray
1.11319e-02	7.920e-02	X-ray
1.33474e-02	1.553e-02	X-ray
1.34935e-02	4.735e-02	X-ray
7.71271e-02	1.165e-01	X-ray
7.96070e-02	1.940e-01	X-ray
8.95836e-02	2.178e-02	X-ray
9.01425e-02	4.225e-02	X-ray
9.27190e-02	1.036e-02	X-ray
3.94466e-05	1.701e+00	Auger electron
9.73034e-05	2.214e+00	Auger electron
1.74775e-04	1.190e+00	Auger electron
4.36101e-04	2.798e-01	Auger electron
1.03612e-03	1.113e-01	Auger electron
2.01368e-03	6.448e-01	Auger electron
2.30680e-03	8.866e-02	Auger electron
8.45615e-03	1.818e-01	Auger electron
1.10084e-02	8.303e-02	Auger electron
5.86705e+00	4.179e-01	Alpha
1.13447e-01	4.179e-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