



POLONIUM-206

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Po-206
Atomic number (Z): 84
Mass number (A): 206
Neutron number (N): 122

RADIOACTIVE DECAY

Decay modes: α , Electron capture
Half-life: 8.8 [d]
Decay constant: 9.1165×10^{-7} [1/s]
Daughters: Bi-206 (94.5%), Pb-202 (5.45%)
Radioactive daughters: Bi-206, Pb-202

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.2902 [MeV]
Mean electron energy: 0.1655 [MeV]
Mean photon energy: 1.19277 [MeV]
Air kerma rate constant, Γ_{10} : 7.028×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 7.028×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 7.301×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 4.650×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]

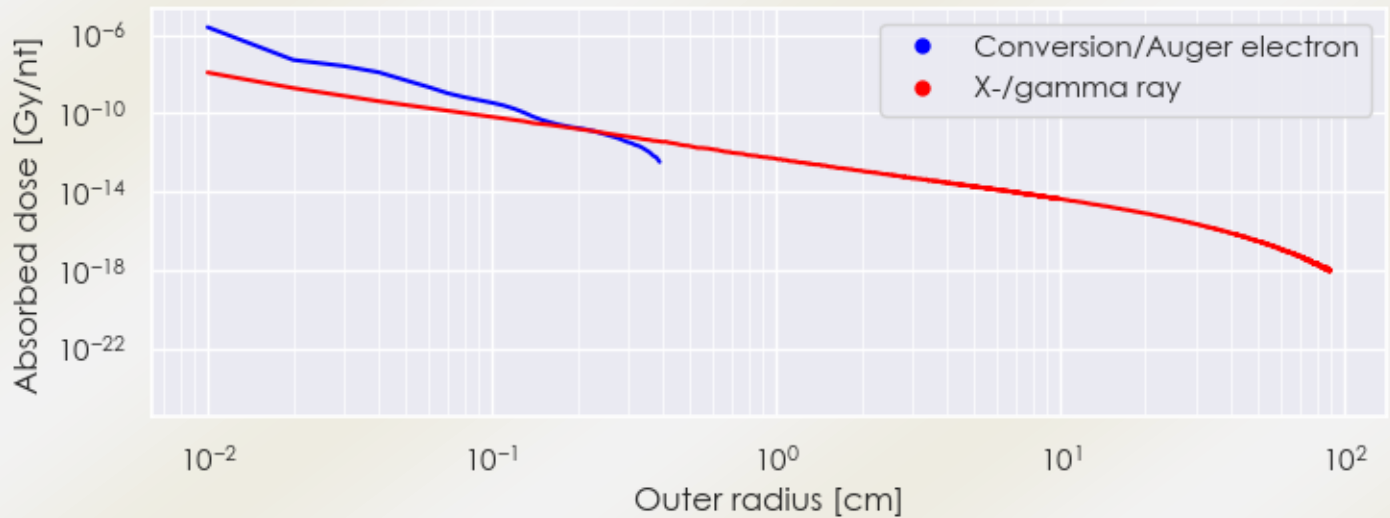
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 2.652×10^{-14} [Gy · kg/Bq · s]

Equilibrium dose constant for photons, Δ_p : 1.911×10^{-13} [Gy · kg/Bq · s]

DOSE POINT KERNELS (PLOT)

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

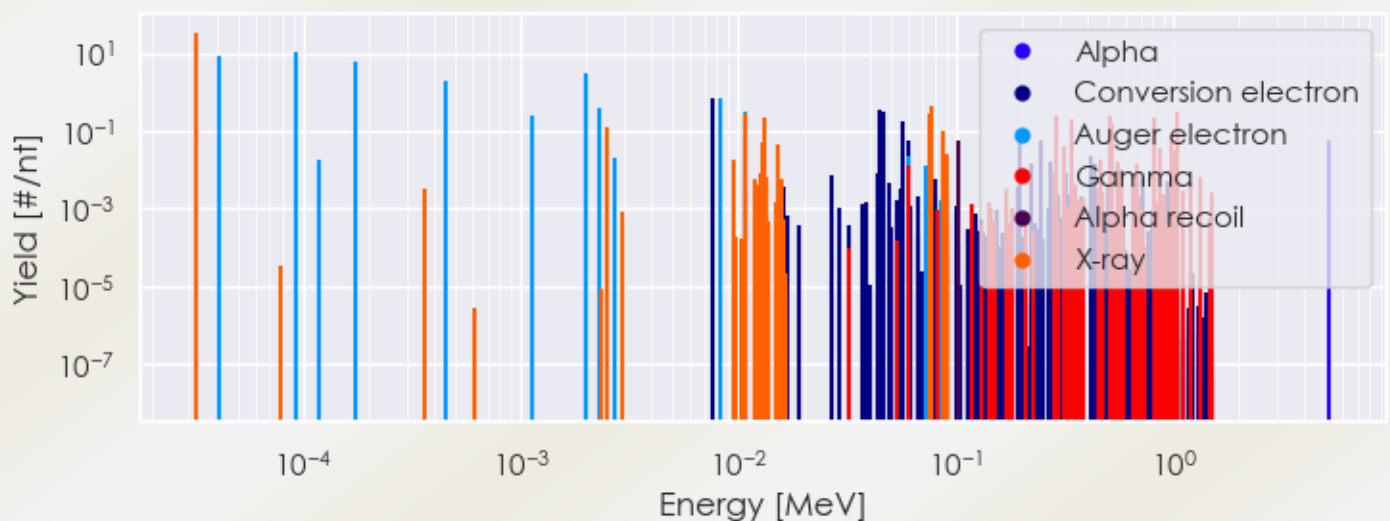
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Po-206 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/Po-206 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/Po-206 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Po-206%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
3.24763e-05	3.498e+01	X-ray
2.47684e-03	1.277e-01	X-ray
9.45109e-03	1.722e-02	X-ray
1.07270e-02	3.012e-02	X-ray
1.08390e-02	2.653e-01	X-ray
1.29844e-02	5.151e-02	X-ray
1.30700e-02	2.204e-01	X-ray
1.53031e-02	4.552e-02	X-ray
5.99080e-02	1.225e-02	Gamma
7.50642e-02	2.771e-01	X-ray
7.74071e-02	4.634e-01	X-ray
8.71393e-02	5.182e-02	X-ray
8.76651e-02	1.004e-01	X-ray
9.00323e-02	1.243e-02	X-ray
9.01629e-02	2.448e-02	X-ray
2.86410e-01	2.383e-01	Gamma
3.11560e-01	4.243e-02	Gamma
3.38440e-01	1.917e-01	Gamma
4.63380e-01	1.793e-02	Gamma
5.11360e-01	2.405e-01	Gamma
5.22470e-01	1.573e-01	Gamma
5.54640e-01	1.557e-02	Gamma
5.79780e-01	1.057e-02	Gamma
6.77710e-01	1.473e-02	Gamma
8.07380e-01	2.269e-01	Gamma
8.18230e-01	1.044e-02	Gamma
8.60930e-01	3.540e-02	Gamma

9.80230e-01	7.080e-02	Gamma
1.00715e+00	3.063e-02	Gamma
1.03226e+00	3.290e-01	Gamma
4.07424e-05	8.324e+00	Auger electron
9.19631e-05	1.099e+01	Auger electron
1.18687e-04	1.732e-02	Auger electron
1.75597e-04	5.979e+00	Auger electron
4.55125e-04	1.932e+00	Auger electron
1.11820e-03	2.631e-01	Auger electron
1.98411e-03	2.904e+00	Auger electron
2.27899e-03	3.896e-01	Auger electron
2.70477e-03	2.038e-02	Auger electron
7.66910e-03	6.845e-01	Conversion electron
8.32218e-03	6.794e-01	Auger electron
1.07881e-02	3.058e-01	Auger electron
1.08360e-02	2.230e-01	Conversion electron
1.32832e-02	3.288e-02	Auger electron
4.41400e-02	3.465e-01	Conversion electron
4.64830e-02	3.200e-01	Conversion electron
5.67411e-02	1.789e-01	Conversion electron
5.99080e-02	5.596e-02	Conversion electron
6.03003e-02	2.296e-02	Auger electron
7.26460e-02	1.262e-02	Auger electron
1.95578e-01	1.080e-01	Conversion electron
2.20728e-01	1.502e-02	Conversion electron
2.47608e-01	5.552e-02	Conversion electron
2.70034e-01	1.685e-02	Conversion electron
4.20528e-01	2.268e-02	Conversion electron
4.31638e-01	1.398e-02	Conversion electron
5.22301e+00	5.450e-02	Alpha
1.03493e-01	5.450e-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/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6