

Bi-200 (36.4m) ECB+	Bi-201 (108m) ECB+	Bi-202 (1.72h) ECB+	Bi-203 (11.76h) ECB+	Bi-204 (11.22h) ECB+	Bi-205 (15.31d) ECB+	Bi-206 (6.243d) ECB+	Bi-207 (32.9y) ECB+	
Pb-198 (2.4h) EC	Pb-199 (90m) ECB+	Pb-200 (21.5h) EC	Pb-201 (9.4h) EC	Pb-202 (5.25E+4y) ECA	Pb-203 (5.17y) EC	Pb-204 (STABLE)	Pb-205 (1.53E+7y) EC	Pb-206 (STABLE)
Tl-197 (2.84h) ECB+	Tl-198 (5.3h) ECB+	Tl-199 (7.42h) ECB+	Tl-200 (26.1h) ECB+	Tl-201 (12.2h) EC	Tl-202 (12.2h) EC	Tl-203 (STABLE)	Tl-204 (3.78y) B-EC	Tl-205 (STABLE)

LEAD-202

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pb-202
Atomic number (Z): 82
Mass number (A): 202
Neutron number (N): 120

RADIOACTIVE DECAY

Decay modes: α , Electron capture
Half-life: 52500.0 [y]
Decay constant: $4.1838\text{e-}13$ [1/s]
Daughters: Tl-202 (99.0%), Hg-198 (1.0%)
Radioactive daughters: Tl-202

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0259 [MeV]
Mean electron energy: 0.00614 [MeV]
Mean photon energy: 0.00249 [MeV]
Air kerma rate constant, Γ_{10} : $1.058\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $1.058\text{e-}17$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $5.133\text{e-}15$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $4.150\text{e-}15$ [Gy $\cdot$ kg/Bq $\cdot$ s]

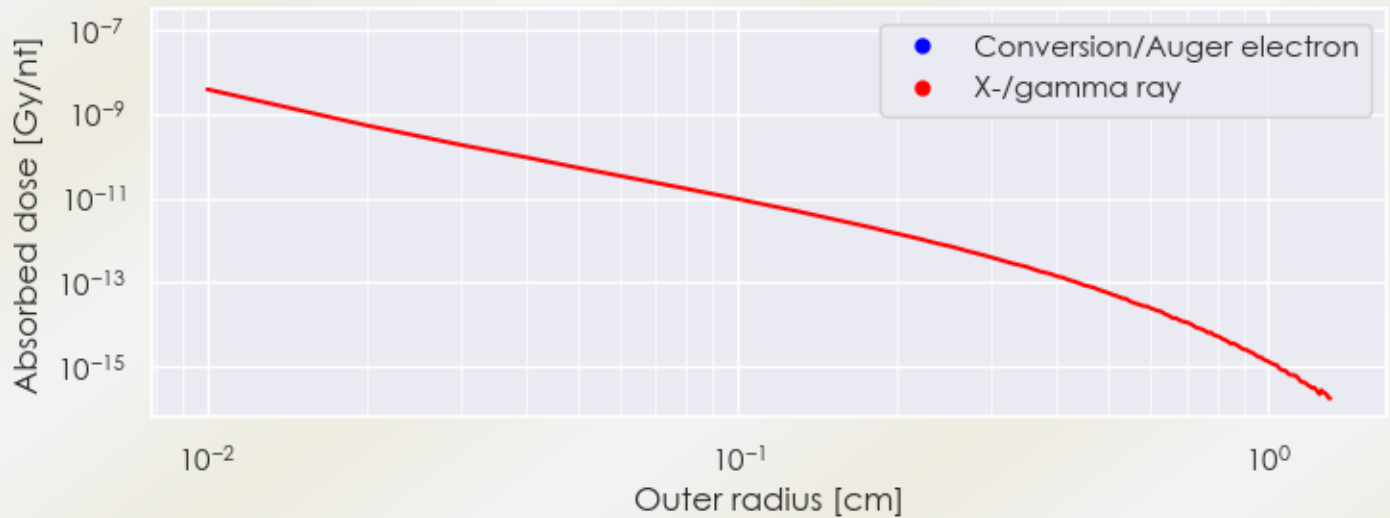
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta+,e-}$: 9.837×10^{-16} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.989×10^{-16} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

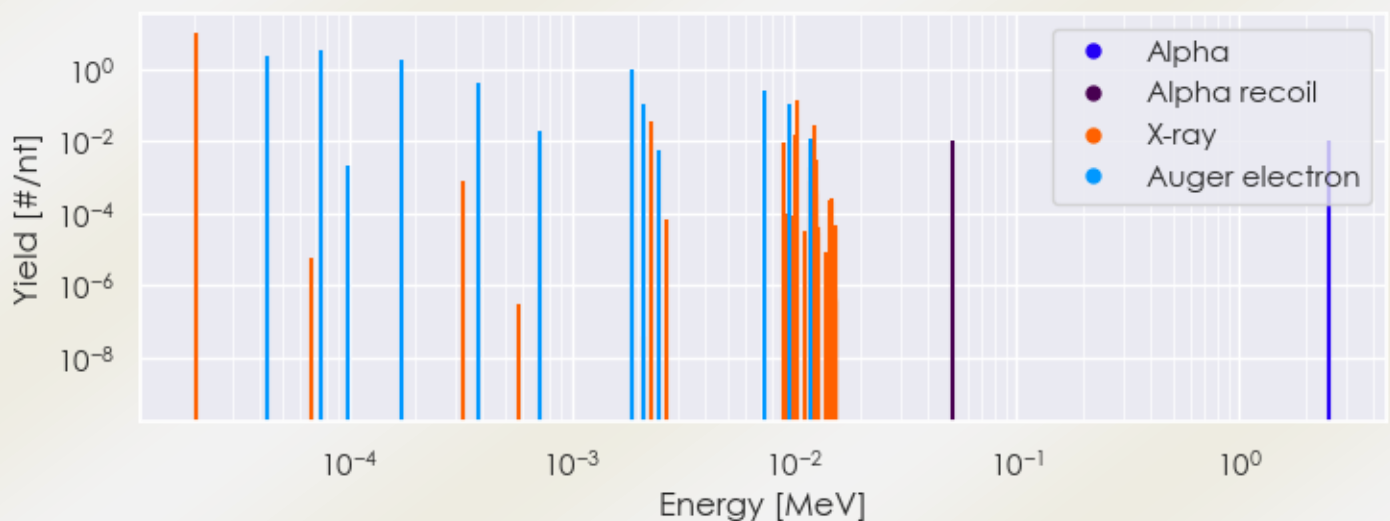
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Pb-202 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/Pb-202 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/Pb-202 Summary Spectrum.csv

Energy [MeV]	Yield [#/(n ^t) if > 0.01	Radiation type
2.07162e-05	1.073e+01	X-ray
2.29156e-03	3.704e-02	X-ray
1.01663e-02	1.606e-02	X-ray
1.02661e-02	1.414e-01	X-ray
1.22749e-02	2.695e-02	X-ray
4.28402e-05	2.370e+00	Auger electron
7.47350e-05	3.501e+00	Auger electron
1.72443e-04	1.846e+00	Auger electron
3.81965e-04	4.312e-01	Auger electron
7.22326e-04	2.032e-02	Auger electron
1.85167e-03	9.697e-01	Auger electron
2.09836e-03	1.151e-01	Auger electron
7.33672e-03	2.696e-01	Auger electron
9.58576e-03	1.162e-01	Auger electron
1.18406e-02	1.200e-02	Auger electron
2.54652e+00	1.000e-02	Alpha
5.14783e-02	1.000e-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