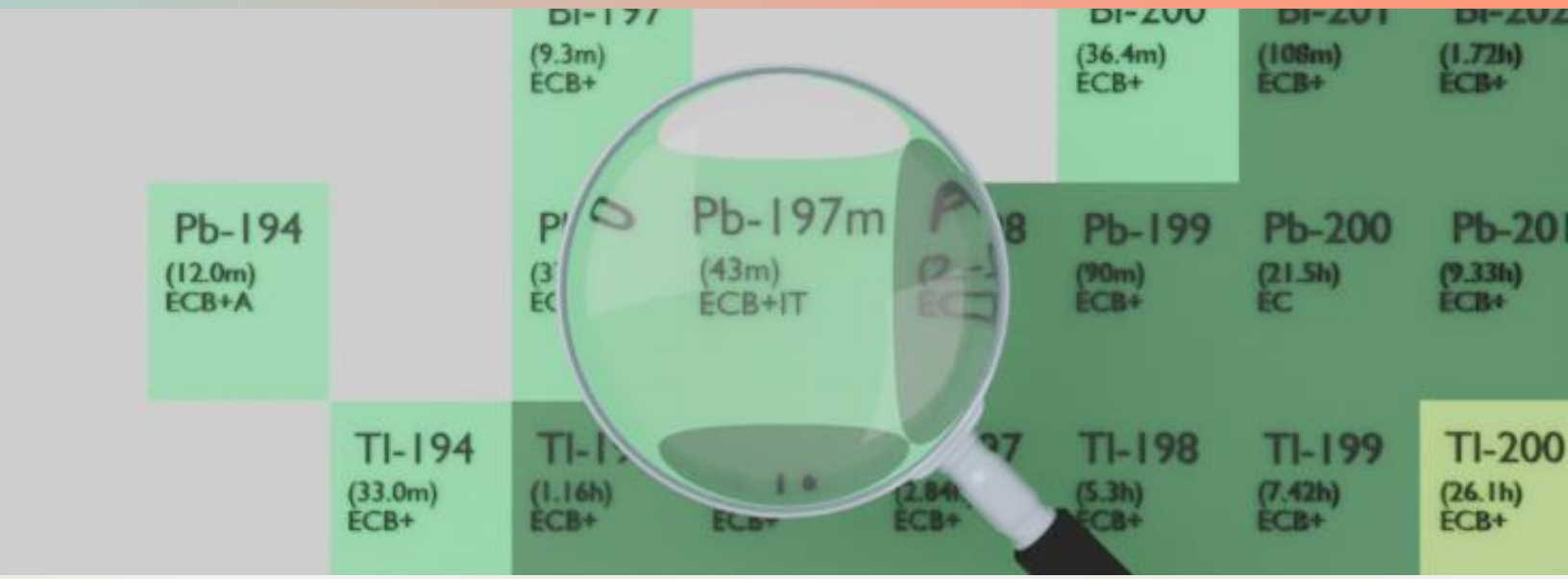


LEAD-197M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Pb-197m
Atomic number (Z): 82
Mass number (A): 197
Neutron number (N): 115

RADIOACTIVE DECAY

Decay modes: β+, Electron capture, Internal transition
Half-life: 43.0 [m]
Decay constant: 2.6866e-04 [1/s]
Daughters: Tl-197 (81.0%), Pb-197 (19.0%)
Radioactive daughters: Tl-197, Pb-197

DOSIMETRIC CONSTANTS

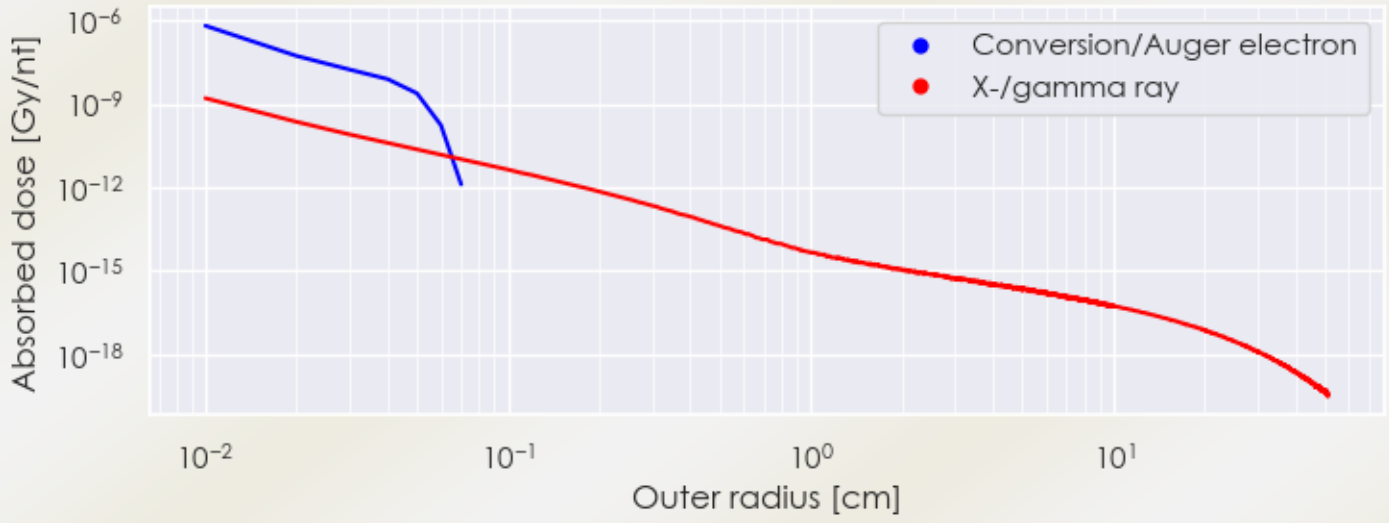
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.2477 [MeV]
Mean photon energy: 1.17319 [MeV]
Air kerma rate constant, Γ_{10}: 6.581e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air}: 6.663e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 3.969e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}: 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 3.969e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 1.880e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

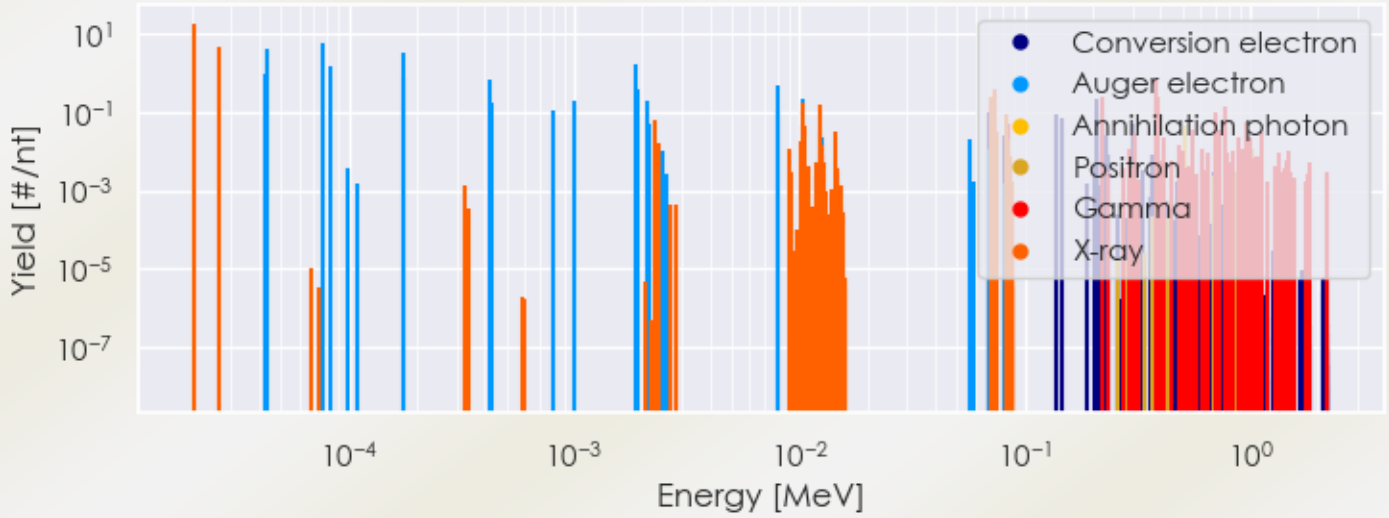
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Pb-197m DPK.csv

SUMMARY SPECTRA (PLOT)

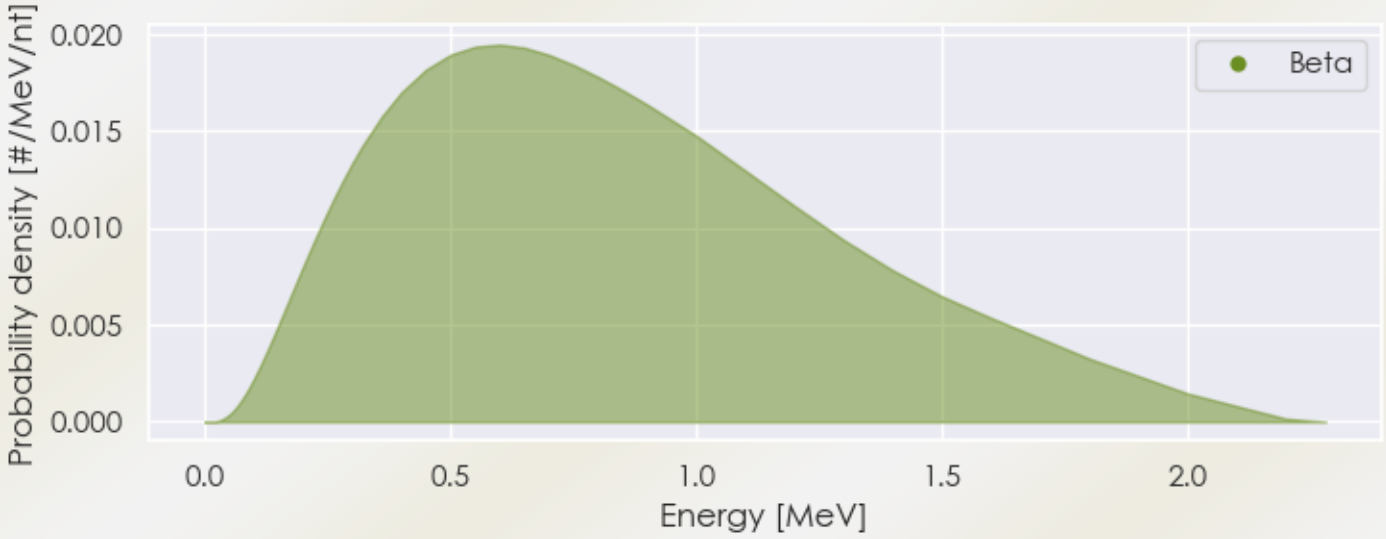
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Pb-197m Summary Spectrum.csv

BETA SPECTRA (PLOT)

Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated beta spectra file here: www.mirdsoft.org/products/MIRDspecs/Pb-197m Beta 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-197m Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
2.07438e-05	1.858e+01	X-ray
2.66144e-05	4.412e+00	X-ray
2.30378e-03	6.494e-02	X-ray
2.37848e-03	1.647e-02	X-ray
8.98130e-03	1.088e-02	X-ray
1.01663e-02	1.901e-02	X-ray
1.02661e-02	1.674e-01	X-ray
1.05510e-02	4.289e-02	X-ray
1.22523e-02	1.548e-01	X-ray

1.22749e-02	3.190e-02	X-ray
1.26563e-02	1.486e-02	X-ray
1.43397e-02	3.127e-02	X-ray
7.10519e-02	2.375e-01	X-ray
7.30390e-02	1.905e-02	X-ray
7.31380e-02	4.007e-01	X-ray
7.52501e-02	3.200e-02	X-ray
8.23884e-02	4.445e-02	X-ray
8.28534e-02	8.606e-02	X-ray
8.49000e-02	4.807e-02	Gamma
8.50837e-02	1.054e-02	X-ray
8.51979e-02	2.067e-02	X-ray
2.22750e-01	2.461e-01	Gamma
2.90950e-01	1.130e-02	Gamma
3.07900e-01	2.988e-02	Gamma
3.85850e-01	7.357e-01	Gamma
3.87720e-01	2.511e-01	Gamma
4.16210e-01	2.285e-02	Gamma
4.88240e-01	1.381e-02	Gamma
5.06000e-01	1.055e-02	Gamma
5.11000e-01	4.248e-02	Annihilation photon
5.57800e-01	3.515e-02	Gamma
6.16420e-01	1.105e-02	Gamma
6.95620e-01	9.542e-02	Gamma
7.06840e-01	1.582e-02	Gamma
7.15070e-01	1.105e-02	Gamma
7.24110e-01	3.741e-02	Gamma
7.74260e-01	1.406e-01	Gamma
8.35760e-01	1.030e-02	Gamma
8.93280e-01	2.134e-02	Gamma
9.20250e-01	1.155e-02	Gamma
9.57700e-01	5.876e-02	Gamma
9.98590e-01	2.385e-02	Gamma
1.11766e+00	3.214e-02	Gamma
1.01673e+00	1.089e-02	Positron
4.21378e-05	9.963e-01	Auger electron
4.30532e-05	4.081e+00	Auger electron
7.59354e-05	6.087e+00	Auger electron

8.27457e-05	1.426e+00	Auger electron
1.73849e-04	7.487e-01	Auger electron
1.74981e-04	3.205e+00	Auger electron
4.24214e-04	7.048e-01	Auger electron
4.27081e-04	1.770e-01	Auger electron
8.07228e-04	1.081e-01	Auger electron
9.94332e-04	1.907e-01	Auger electron
1.86377e-03	1.668e+00	Auger electron
1.90746e-03	3.974e-01	Auger electron
2.11143e-03	1.968e-01	Auger electron
2.16750e-03	4.944e-02	Auger electron
7.95849e-03	4.946e-01	Auger electron
8.01520e-03	1.046e-01	Auger electron
1.02559e-02	2.156e-01	Auger electron
1.03957e-02	4.626e-02	Auger electron
1.25834e-02	2.259e-02	Auger electron
5.72241e-02	2.058e-02	Auger electron
6.88063e-02	1.120e-02	Auger electron
6.90530e-02	9.782e-02	Conversion electron
8.18454e-02	2.548e-02	Conversion electron
1.36952e-01	8.658e-02	Conversion electron
1.46110e-01	6.753e-02	Conversion electron
2.07420e-01	2.332e-02	Conversion electron
2.08004e-01	2.233e-01	Conversion electron
2.10090e-01	1.024e-01	Conversion electron
2.18553e-01	3.644e-02	Conversion electron
2.19805e-01	9.517e-02	Conversion electron
2.21360e-01	4.009e-02	Conversion electron
2.22750e-01	2.936e-02	Conversion electron
2.31345e-01	2.550e-02	Conversion electron
3.00052e-01	5.222e-02	Conversion electron
3.01922e-01	3.596e-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