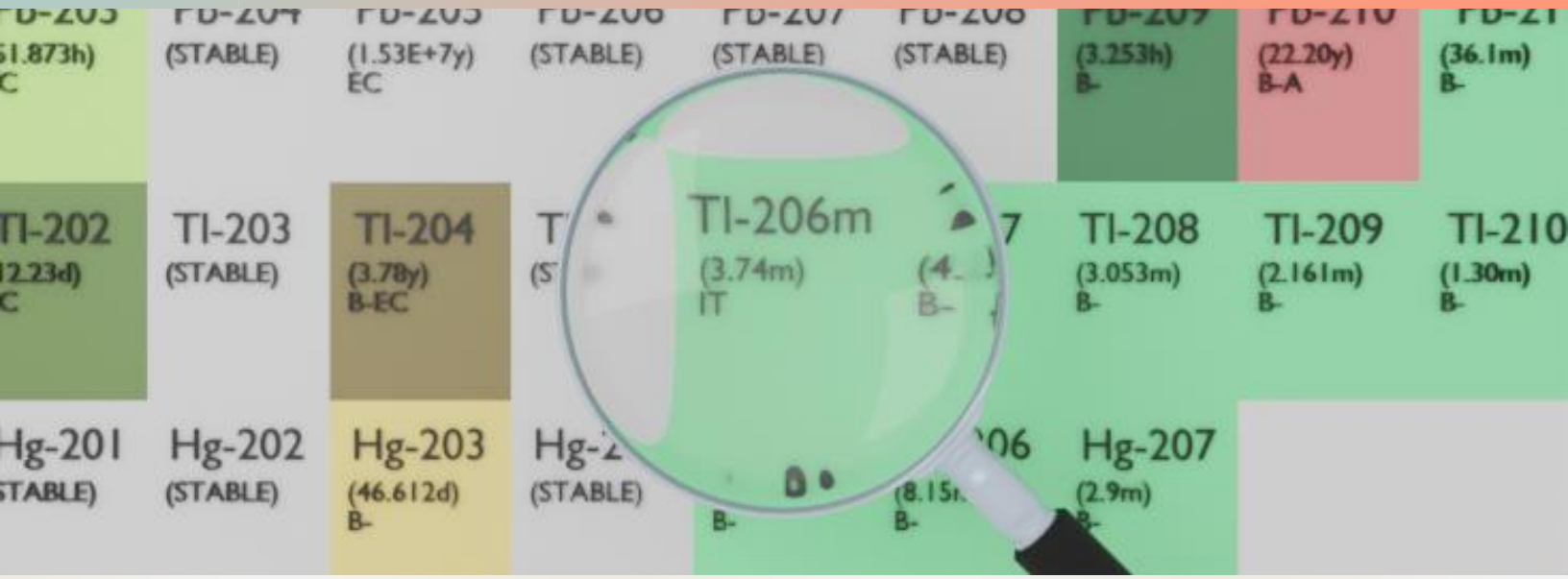


THALLIUM-206M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tl-206m
Atomic number (Z): 81
Mass number (A): 206
Neutron number (N): 125

RADIOACTIVE DECAY

Decay modes: Internal transition
Half-life: 3.74 [m]
Decay constant: 3.0889e-03 [1/s]
Daughters: Tl-206 (100.0%)
Radioactive daughters: Tl-206

DOSIMETRIC CONSTANTS

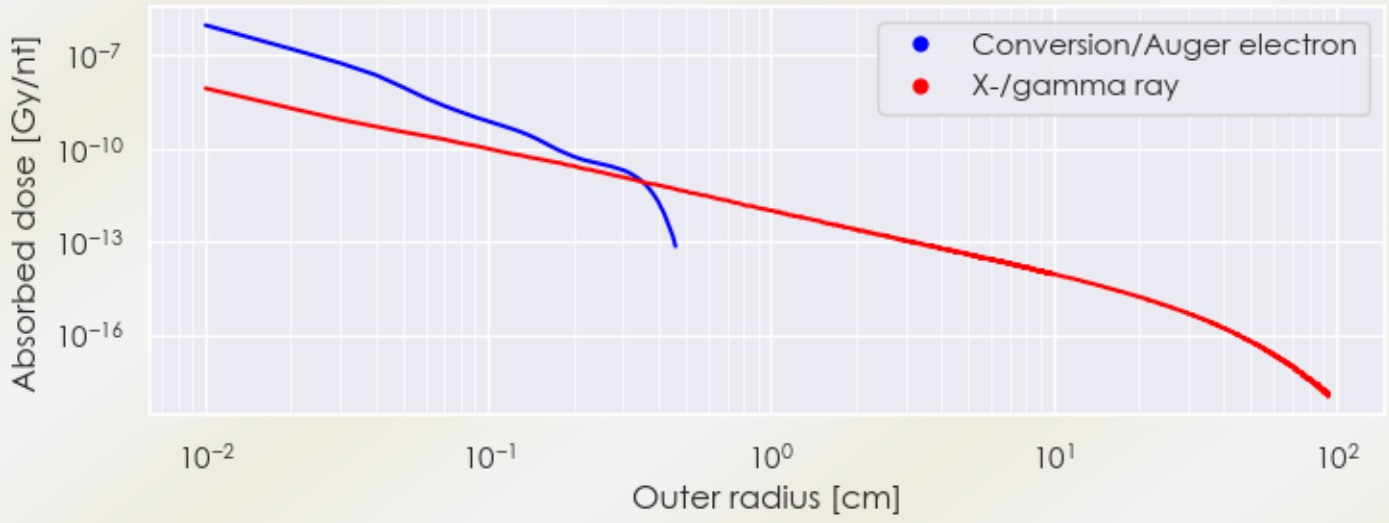
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.20034 [MeV]
Mean photon energy: 2.4192 [MeV]
Air kerma rate constant, Γ_{10}: 9.711e-17 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 9.711e-17 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 3.210e-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, $\Delta_{\beta-,\beta+,e-}$: 3.210e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 3.876e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

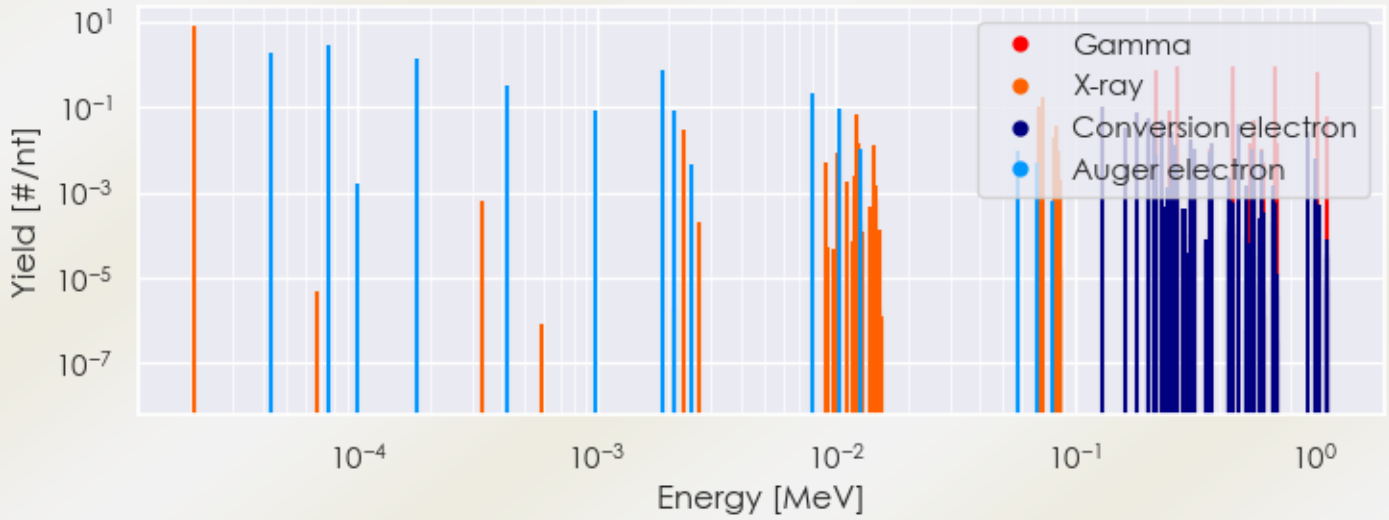
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tl-206m 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/Tl-206m 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/Tl-206m Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
2.07421e-05	8.144e+00	X-ray
2.30260e-03	2.855e-02	X-ray
1.02661e-02	7.646e-02	X-ray
1.22523e-02	6.401e-02	X-ray
1.22749e-02	1.457e-02	X-ray
1.43397e-02	1.293e-02	X-ray
7.10519e-02	1.028e-01	X-ray
7.31380e-02	1.734e-01	X-ray
8.23883e-02	1.924e-02	X-ray
8.28534e-02	3.725e-02	X-ray
2.16400e-01	7.396e-01	Gamma
2.47200e-01	8.600e-02	Gamma
2.65700e-01	8.600e-01	Gamma
3.04900e-01	1.290e-02	Gamma
3.68200e-01	1.032e-02	Gamma
4.53300e-01	9.288e-01	Gamma
4.57200e-01	2.236e-01	Gamma
5.35500e-01	1.376e-02	Gamma
5.64200e-01	5.160e-02	Gamma
6.04300e-01	1.032e-02	Gamma
6.86500e-01	9.030e-01	Gamma
7.04600e-01	1.462e-02	Gamma
1.02150e+00	6.880e-01	Gamma
1.13990e+00	6.020e-02	Gamma
4.30404e-05	1.788e+00	Auger electron
7.58248e-05	2.669e+00	Auger electron
1.74797e-04	1.403e+00	Auger electron

4.21397e-04	3.064e-01	Auger electron
9.77371e-04	8.369e-02	Auger electron
1.86220e-03	7.337e-01	Auger electron
2.10910e-03	8.651e-02	Auger electron
7.92216e-03	2.187e-01	Auger electron
1.02174e-02	9.528e-02	Auger electron
1.30602e-01	1.039e-01	Conversion electron
1.61402e-01	3.171e-02	Conversion electron
1.79902e-01	7.393e-02	Conversion electron
2.01070e-01	1.421e-02	Conversion electron
2.01654e-01	5.231e-02	Conversion electron
2.03740e-01	3.073e-02	Conversion electron
2.13455e-01	2.525e-02	Conversion electron
2.31002e-01	4.886e-02	Conversion electron
2.50370e-01	1.029e-02	Conversion electron
2.50954e-01	2.547e-02	Conversion electron
2.53040e-01	1.351e-02	Conversion electron
2.62755e-01	1.268e-02	Conversion electron
3.01470e-01	1.804e-02	Conversion electron
3.04140e-01	1.260e-02	Conversion electron
3.71402e-01	1.469e-02	Conversion electron
4.78402e-01	4.125e-02	Conversion electron
5.48870e-01	1.024e-02	Conversion electron
9.35702e-01	2.657e-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