



THORIUM-226

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Th-226
Atomic number (Z): 90
Mass number (A): 226
Neutron number (N): 136

RADIOACTIVE DECAY

Decay modes: α
Half-life: 30.57 [m]
Decay constant: 3.7790×10^{-4} [1/s]
Daughters: Ra-222 (100.0%)
Radioactive daughters: Ra-222

DOSIMETRIC CONSTANTS

Mean alpha energy: 6.4218 [MeV]
Mean electron energy: 0.02111 [MeV]
Mean photon energy: 0.0089 [MeV]
Air kerma rate constant, Γ_{10} : 2.398×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 2.398×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.032×10^{-12} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 1.029×10^{-12} [Gy $\cdot$ kg/Bq $\cdot$ s]

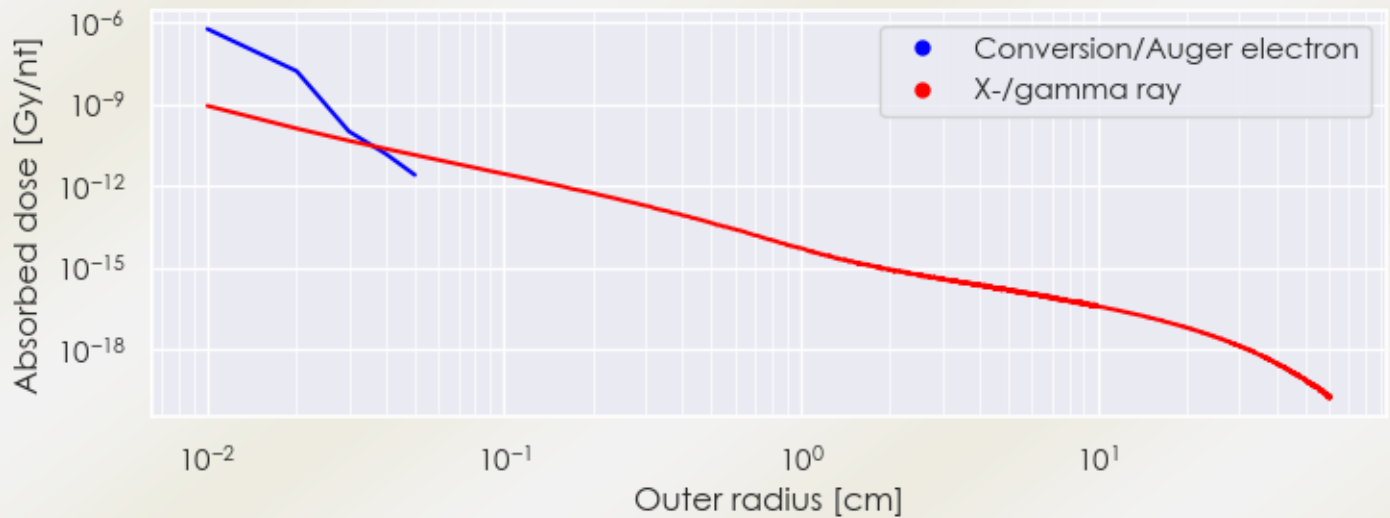
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-\beta^+,e^-}$: 3.382×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.426×10^{-15} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

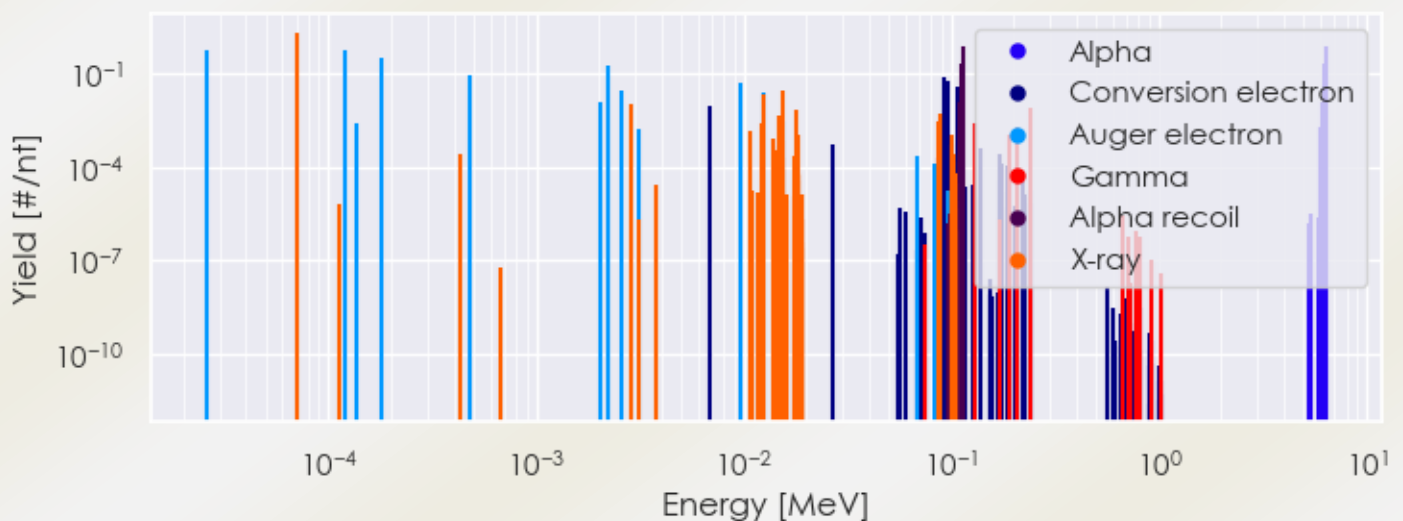
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Th-226 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/Th-226 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/Th-226 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Th-226%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
7.12319e-05	2.185e+00	X-ray
2.89299e-03	1.112e-02	X-ray
1.23447e-02	2.247e-02	X-ray
1.53013e-02	3.083e-02	X-ray
1.11120e-01	3.290e-02	Gamma
2.58036e-05	6.003e-01	Auger electron
1.20967e-04	6.081e-01	Auger electron
1.81472e-04	3.466e-01	Auger electron
4.78355e-04	8.756e-02	Auger electron
2.02182e-03	1.223e-02	Auger electron
2.22805e-03	1.916e-01	Auger electron
2.60325e-03	3.093e-02	Auger electron
9.58515e-03	5.171e-02	Auger electron
1.25254e-02	2.513e-02	Auger electron
9.25600e-02	8.214e-02	Conversion electron
9.56640e-02	5.732e-02	Conversion electron
1.07346e-01	3.927e-02	Conversion electron
1.11120e-01	1.327e-02	Conversion electron
6.09942e+00	1.261e-02	Alpha
6.22809e+00	2.281e-01	Alpha
6.33724e+00	7.553e-01	Alpha
1.09971e-01	1.261e-02	Alpha recoil
1.12291e-01	2.281e-01	Alpha recoil
1.14259e-01	7.553e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6