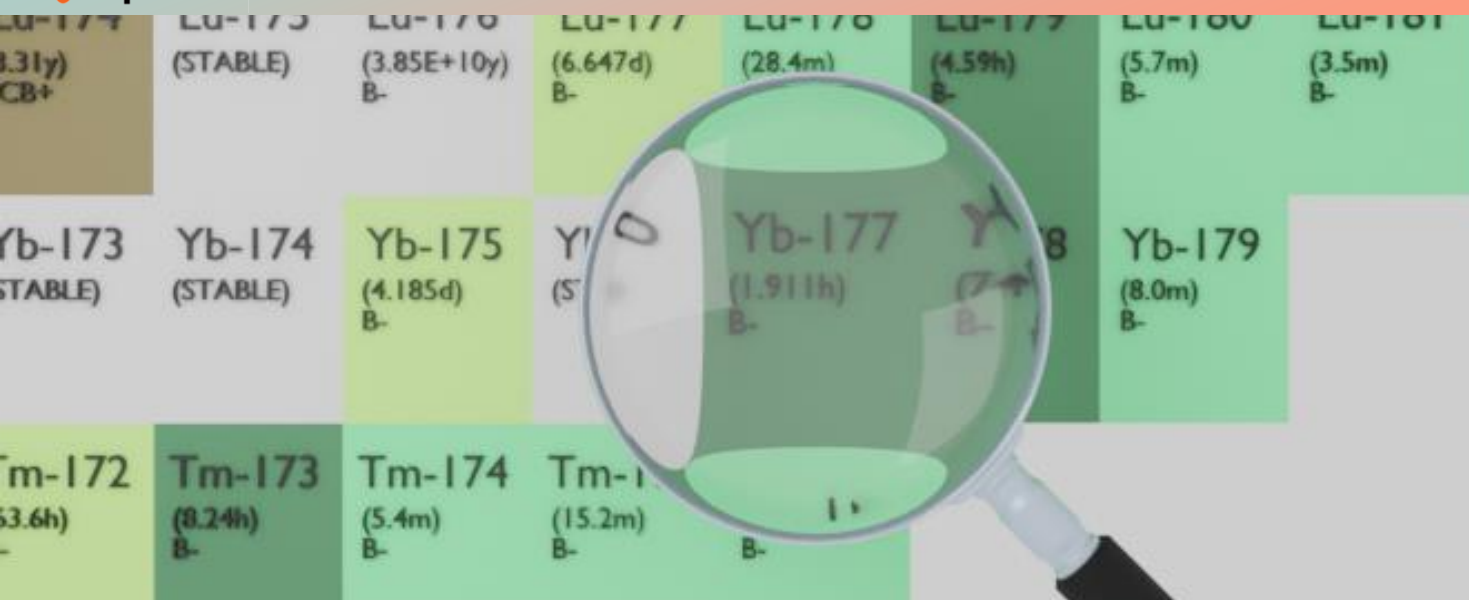




YTTERBIUM-177

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Yb-177
Atomic number (Z): 70
Mass number (A): 177
Neutron number (N): 107

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 1.911 [h]
Decay constant: 1.0075×10^{-4} [1/s]
Daughters: Lu-177 (100.0%)
Radioactive daughters: Lu-177

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.43576 [MeV]
Mean photon energy: 0.19518 [MeV]
Air kerma rate constant, Γ_{10} : 6.902×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 6.902×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.982×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

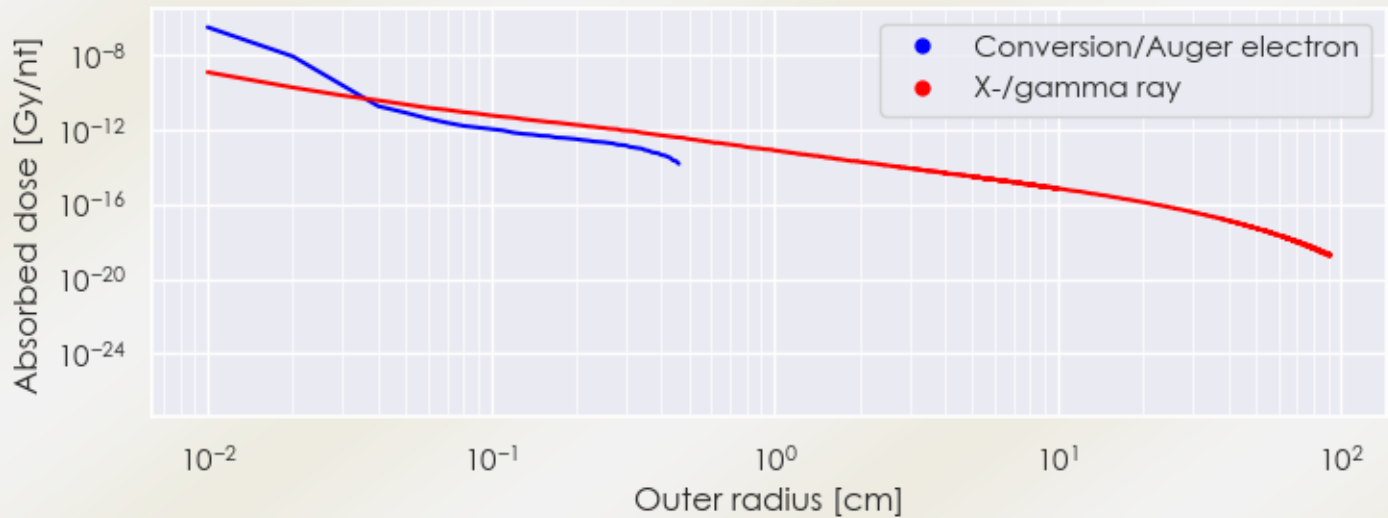
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 6.982×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 3.127×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

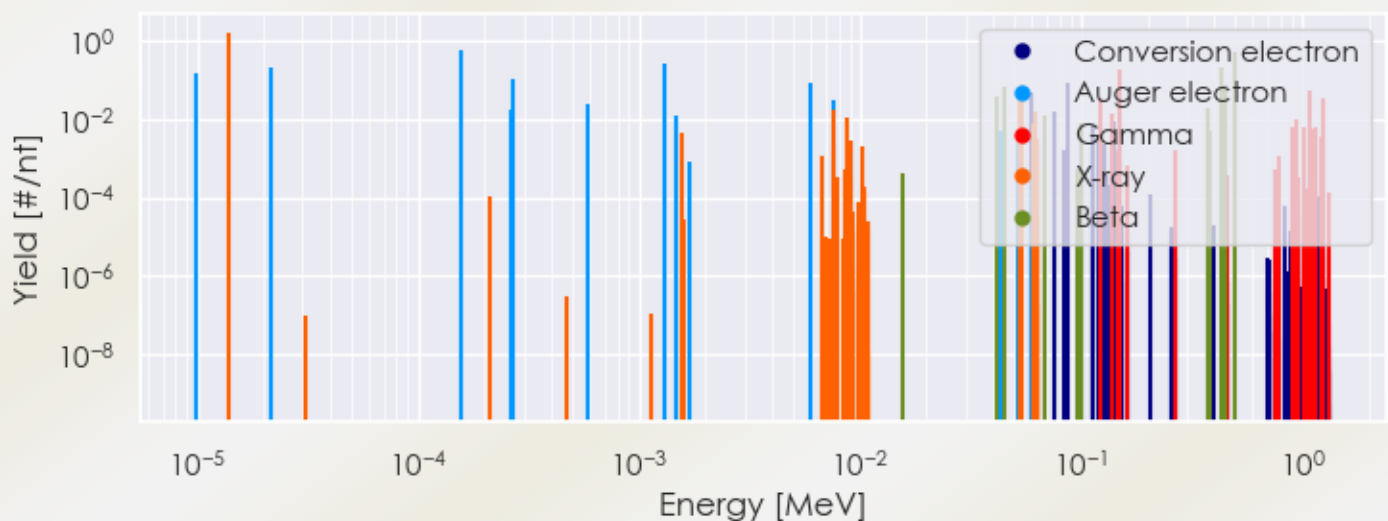
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Yb-177 DPK.csv

SUMMARY SPECTRA (PLOT)

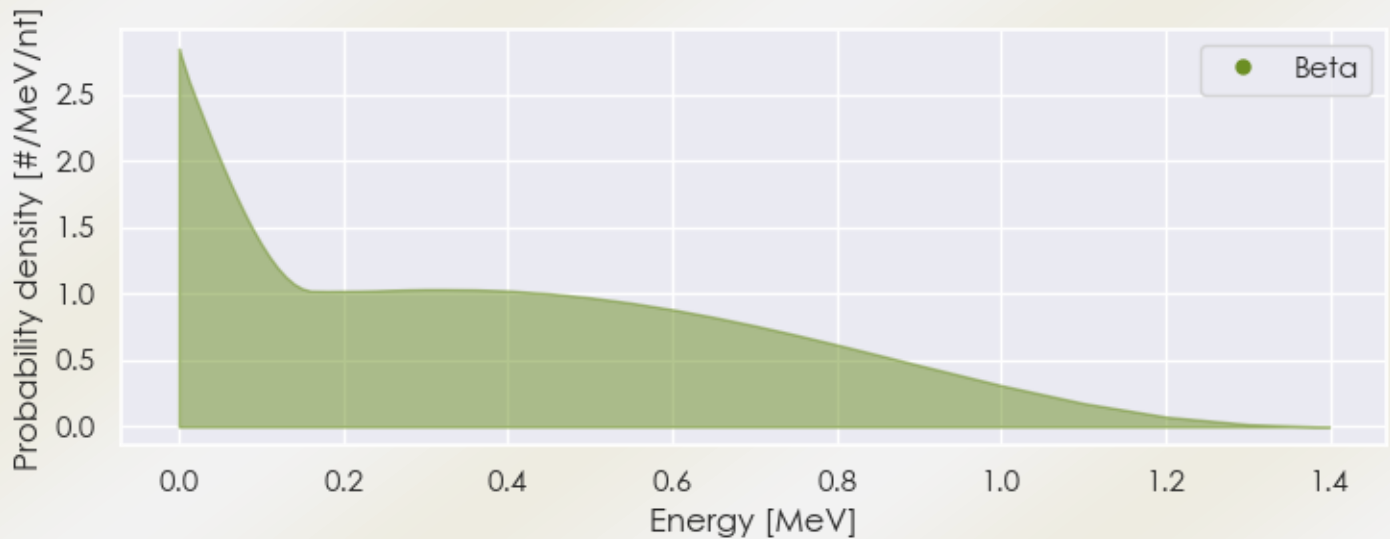
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Yb-177 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/Yb-177 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/Yb-177 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.40226e-05	1.730e+00	X-ray
7.64540e-03	1.770e-02	X-ray
8.72221e-03	1.146e-02	X-ray
5.30692e-02	4.275e-02	X-ray
5.41988e-02	7.507e-02	X-ray
6.14258e-02	1.537e-02	X-ray
1.22700e-01	3.416e-02	Gamma
1.39300e-01	1.344e-02	Gamma
1.50600e-01	2.027e-01	Gamma
1.08020e+00	5.600e-02	Gamma

1.24120e+00	3.472e-02	Gamma
4.18508e-02	3.909e-02	Beta
4.49057e-02	7.217e-02	Beta
6.87473e-02	1.303e-02	Beta
3.78179e-01	2.005e-02	Beta
4.34141e-01	2.105e-01	Beta
4.45891e-01	8.018e-02	Beta
4.96008e-01	5.513e-01	Beta
9.95014e-06	1.501e-01	Auger electron
2.16357e-05	2.129e-01	Auger electron
1.56536e-04	6.175e-01	Auger electron
2.64106e-04	1.863e-02	Auger electron
2.66230e-04	1.098e-01	Auger electron
5.83933e-04	2.468e-02	Auger electron
1.30987e-03	2.606e-01	Auger electron
1.48430e-03	1.253e-02	Auger electron
5.97178e-03	8.557e-02	Auger electron
7.52554e-03	3.125e-02	Auger electron
5.92580e-02	5.166e-02	Conversion electron
7.58580e-02	1.582e-02	Conversion electron
8.71580e-02	8.584e-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