

	Lu-165 (10.74m) ECB+	Lu-167 (51.5m)	Lu-169 (34.06h) ECB+	Lu-170 (2.012d) ECB+	Lu-171 (8.24d) ECB+		
Yb-162 (18.87m) CB+	Yb-163 (11.05m) ECB+	Yb-164 (75.8m) EC	Yb-166 (56.7h) EC	Yb-168 (STABLE)	Yb-169 (32.026d) EC	Yb-170 (STABLE)	
Tm-161 (10.2m) CB+	Tm-162 (21.70m) ECB+	Tm-163 (1.810h) ECB+	Tm-164 (2.0m) ECB+	Tm-166 (7.70m) ECB+	Tm-167 (9.25d) EC	Tm-168 (93.1d) ECB+B-	Tm-169 (STABLE)

YTTERBIUM-166

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Yb-166
Atomic number (Z): 70
Mass number (A): 166
Neutron number (N): 96

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 56.7 [h]
Decay constant: 3.3958×10^{-6} [1/s]
Daughters: Tm-166 (100.0%)
Radioactive daughters: Tm-166

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.04173 [MeV]
Mean photon energy: 0.08676 [MeV]
Air kerma rate constant, Γ_{10} : 3.904×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.904×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.686×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

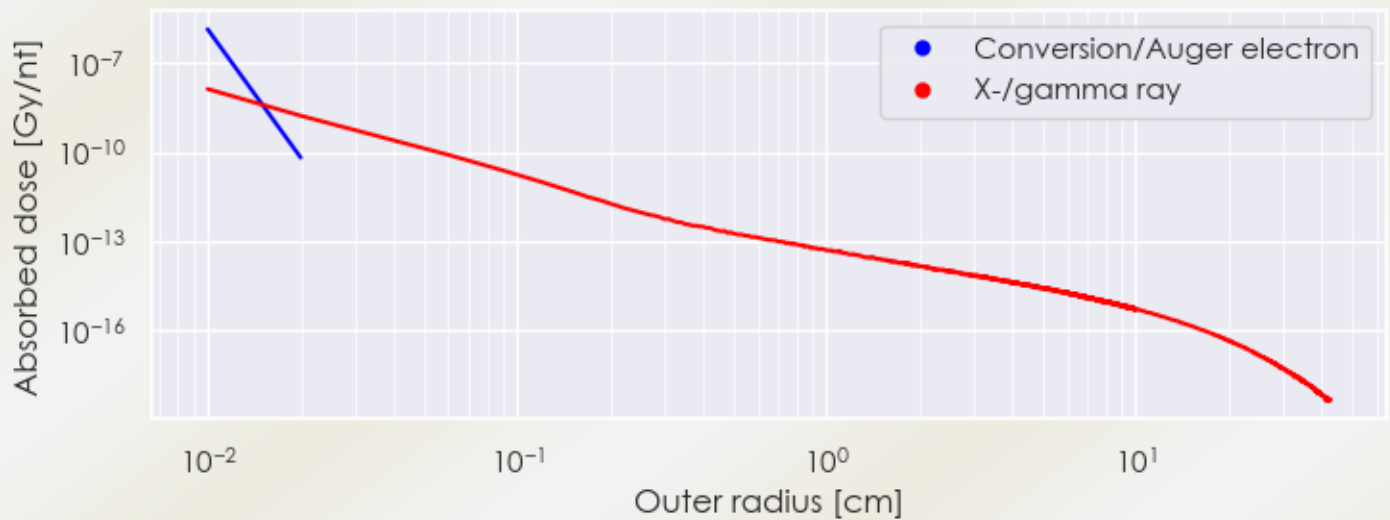
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 6.686×10^{-15} [Gy · kg/Bq · s]

Equilibrium dose constant for photons, Δ_p : 1.390×10^{-14} [Gy · kg/Bq · s]

DOSE POINT KERNELS (PLOT)

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

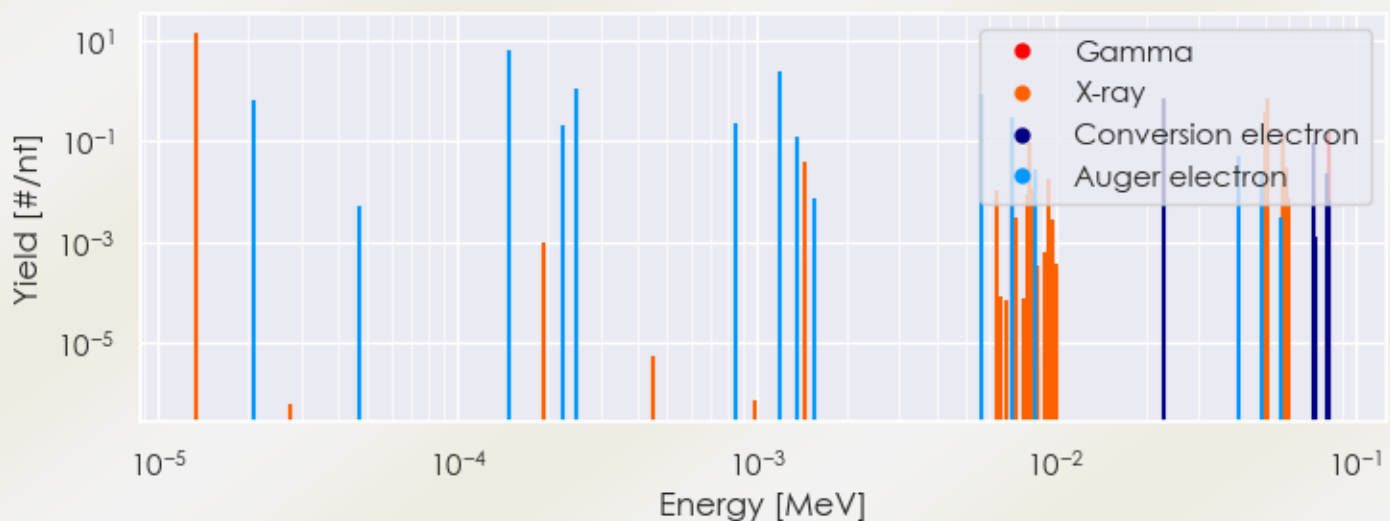
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Yb-166 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-166 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/Yb-166 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Yb-166%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / n _t] if > 0.01	Radiation type
1.33916e-05	1.461e+01	X-ray
1.43539e-03	3.877e-02	X-ray
6.36071e-03	1.062e-02	X-ray
7.12210e-03	1.661e-02	X-ray
7.16830e-03	1.467e-01	X-ray
8.11340e-03	9.664e-02	X-ray
8.21590e-03	1.154e-02	X-ray
8.45978e-03	2.499e-02	X-ray
9.44242e-03	1.716e-02	X-ray
4.98586e-02	3.958e-01	X-ray
5.08500e-02	6.998e-01	X-ray
5.74128e-02	7.333e-02	X-ray
5.76228e-02	1.417e-01	X-ray
5.91167e-02	1.628e-02	X-ray
5.91642e-02	3.148e-02	X-ray
8.22900e-02	1.508e-01	Gamma
2.06752e-05	6.773e-01	Auger electron
1.48015e-04	6.498e+00	Auger electron
2.25690e-04	2.097e-01	Auger electron
2.48178e-04	1.133e+00	Auger electron
8.46852e-04	2.190e-01	Auger electron
1.19490e-03	2.489e+00	Auger electron
1.37042e-03	1.181e-01	Auger electron
5.65276e-03	8.450e-01	Auger electron
7.08834e-03	3.032e-01	Auger electron
8.55593e-03	2.757e-02	Auger electron
2.28020e-02	7.101e-01	Conversion electron

4.07026e-02	4.989e-02	Auger electron
4.84128e-02	2.538e-02	Auger electron
7.22090e-02	9.824e-02	Conversion electron
8.04249e-02	2.420e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6