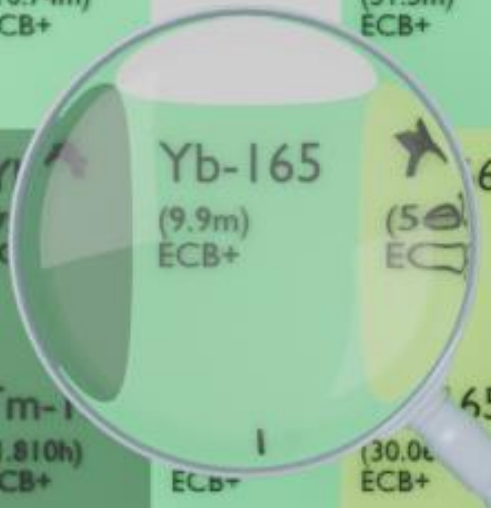




Lu-165 (10.74m) ECB+	Lu-167 (51.5m) ECB+	Lu-169 (34.06h) ECB+	Lu-170 (2.012d) ECB+
Yb-162 (18.87m) ECB+	Yb-163 (11.05m) ECB+	Yb-165 (9.9m) ECB+	Yb-166 (50.5d) ECB+
Yb-167 (17.5m) ECB+	Yb-168 (STABLE) EC	Yb-169 (32.026d) EC	
Tm-161 (30.2m) ECB+	Tm-162 (21.70m) ECB+	Tm-165 (1.810h) ECB+	Tm-166 (7.70h) ECB+
Tm-167 (9.25d) EC	Tm-168 (93.1d) ECB+B-		

YTTERBIUM-165

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Yb-165
Atomic number (Z): 70
Mass number (A): 165
Neutron number (N): 95

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 9.9 [m]
Decay constant: $1.1669\text{e-}03$ [1/s]
Daughters: Tm-165 (100.0%)
Radioactive daughters: Tm-165

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.15178 [MeV]
Mean photon energy: 0.33904 [MeV]
Air kerma rate constant, Γ_{10} : $1.004\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Air kerma coefficient, K_{air} : $1.277\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $2.432\text{e-}14$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]

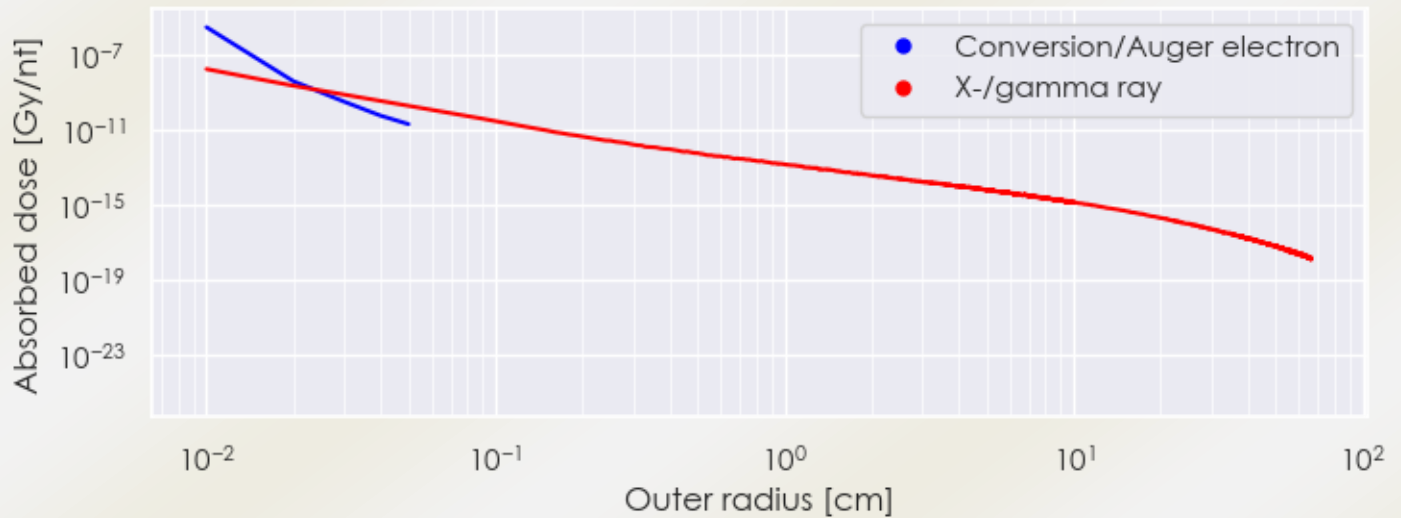
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-\beta+,e-}$: 2.432×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.432×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

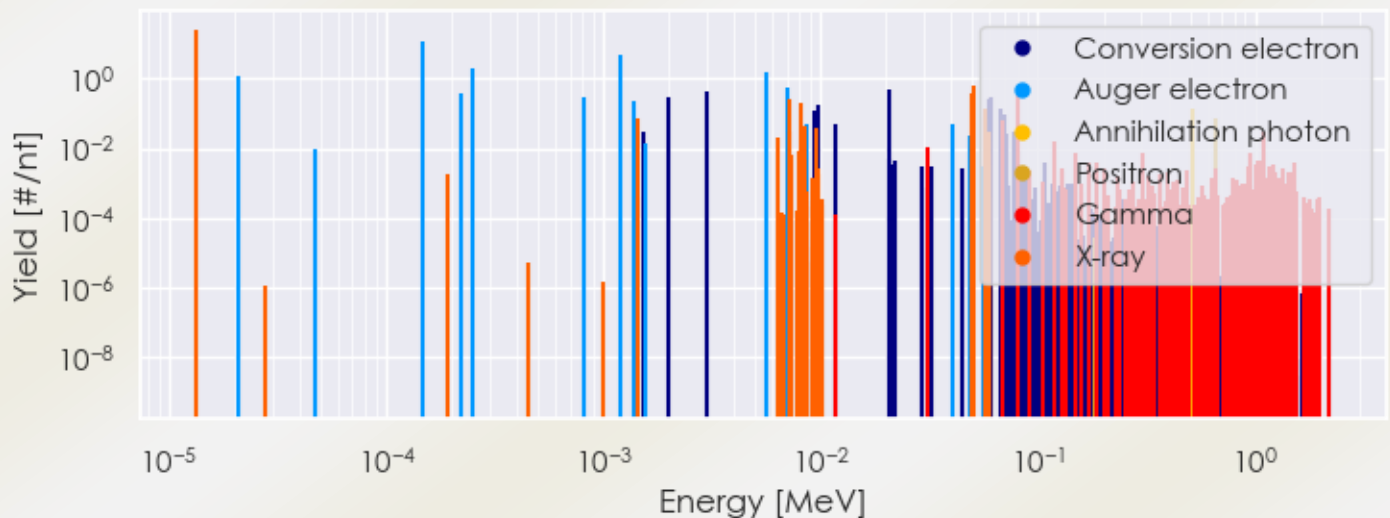
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Yb-165 DPK.csv

SUMMARY SPECTRA (PLOT)

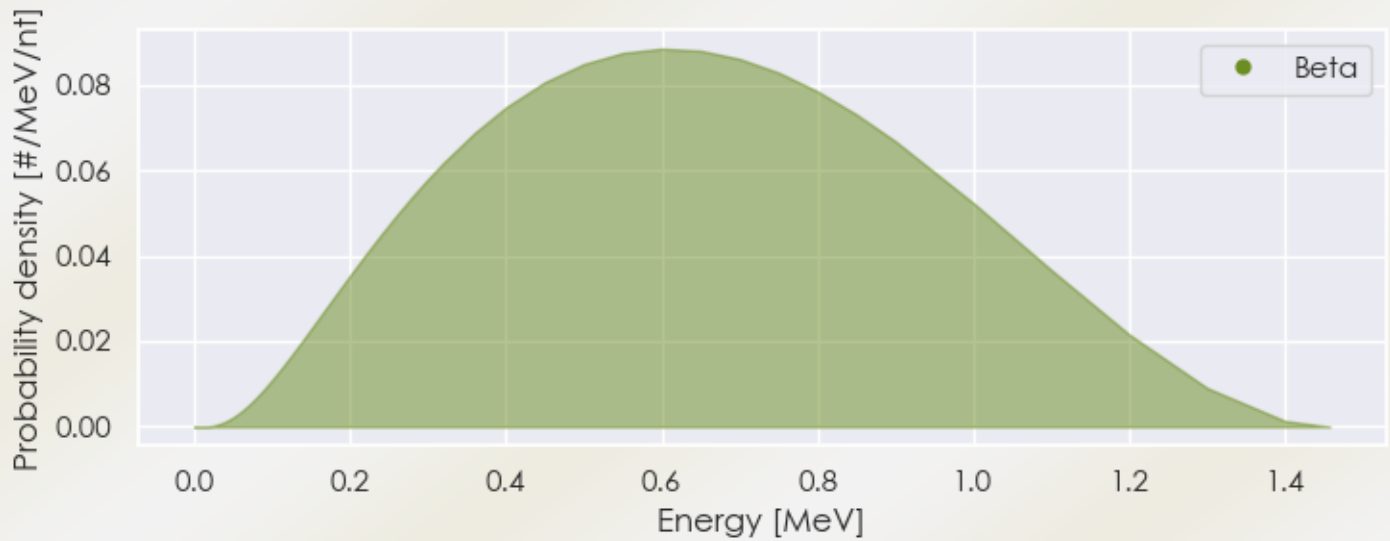
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Yb-165 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-165 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-165 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.34131e-05	2.654e+01	X-ray
1.43499e-03	7.154e-02	X-ray
6.36071e-03	1.947e-02	X-ray
7.12210e-03	3.045e-02	X-ray
7.16830e-03	2.689e-01	X-ray
8.11341e-03	2.058e-01	X-ray
8.21590e-03	1.080e-02	X-ray
8.45977e-03	4.580e-02	X-ray
9.44244e-03	3.655e-02	X-ray
3.08000e-02	1.062e-02	Gamma

4.98586e-02	3.821e-01	X-ray
5.08500e-02	6.754e-01	X-ray
5.74128e-02	7.078e-02	X-ray
5.76229e-02	1.368e-01	X-ray
5.91167e-02	1.571e-02	X-ray
5.91642e-02	3.039e-02	X-ray
6.88600e-02	6.318e-02	Gamma
8.01100e-02	3.366e-01	Gamma
1.18060e-01	1.656e-02	Gamma
5.11000e-01	1.409e-01	Annihilation photon
1.09028e+00	3.051e-02	Gamma
6.62493e-01	7.036e-02	Positron
2.06752e-05	1.213e+00	Auger electron
1.48057e-04	1.181e+01	Auger electron
2.22816e-04	3.773e-01	Auger electron
2.48766e-04	2.034e+00	Auger electron
8.12362e-04	2.962e-01	Auger electron
1.19500e-03	4.590e+00	Auger electron
1.36946e-03	2.176e-01	Auger electron
1.51900e-03	3.183e-02	Conversion electron
1.55904e-03	1.332e-02	Auger electron
1.97060e-03	3.120e-01	Conversion electron
2.96190e-03	4.318e-01	Conversion electron
5.64532e-03	1.555e+00	Auger electron
7.07780e-03	5.576e-01	Auger electron
8.54128e-03	5.066e-02	Auger electron
9.37200e-03	1.145e-01	Conversion electron
9.73490e-03	1.841e-01	Conversion electron
1.16000e-02	4.807e-02	Conversion electron
2.06220e-02	4.719e-01	Conversion electron
4.07026e-02	4.815e-02	Auger electron
4.84128e-02	2.449e-02	Auger electron
5.85720e-02	2.772e-02	Conversion electron
5.87790e-02	1.299e-02	Conversion electron
5.92306e-02	2.732e-01	Conversion electron
6.02219e-02	2.905e-01	Conversion electron
6.69949e-02	1.415e-01	Conversion electron
6.88600e-02	3.723e-02	Conversion electron

7.00290e-02	9.271e-02	Conversion electron
7.04806e-02	1.342e-02	Conversion electron
7.14719e-02	2.555e-02	Conversion electron
7.82449e-02	3.146e-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