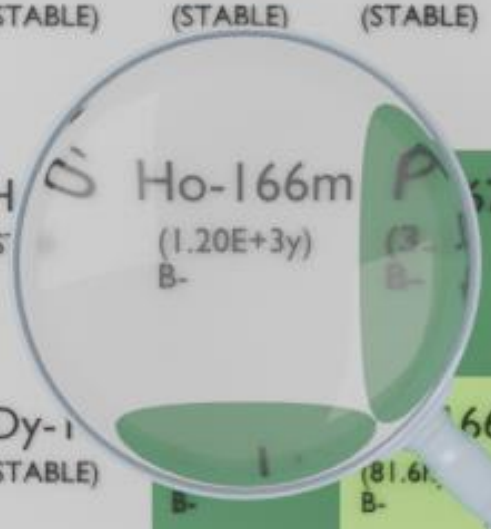




Er-165 (75.0m) CB+	Er-167 (STABLE)	Er-168 (10.36h) EC	Er-169 (STABLE)	Er-170 (STABLE)	Er-171 (STABLE)	Er-172 (9.40d) B-	Er-173 (STABLE)	Er-174 (7.516h) B-
Ho-162 (5.0m) CB+	Ho-163 (4570y) EC	Ho-164 (29m) ECB-	Ho-165 (3.08m) B-	Ho-166m (1.20E+3y) B-	Ho-167 (3.26d) B-	Ho-168 (2.99m) B-	Ho-169 (1.28m) B-	Ho-170 (2.76m) B-
Dy-161 (STABLE)	Dy-162 (STABLE)	Dy-163 (STABLE)	Dy-164 (STABLE)	Dy-165 (STABLE)	Dy-166 (81.6d) B-	Dy-167 (6.20m) B-	Dy-168 (8.7m) B-	Dy-169 (STABLE)

HOLMIUM-166M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ho-166m
Atomic number (Z): 67
Mass number (A): 166
Neutron number (N): 99

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 1200.0 [y]
Decay constant: 1.8304×10^{-11} [1/s]
Daughters: Er-166 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.14973 [MeV]
Mean photon energy: 1.6249 [MeV]
Air kerma rate constant, Γ_{10} : 5.971×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 5.971×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.399×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

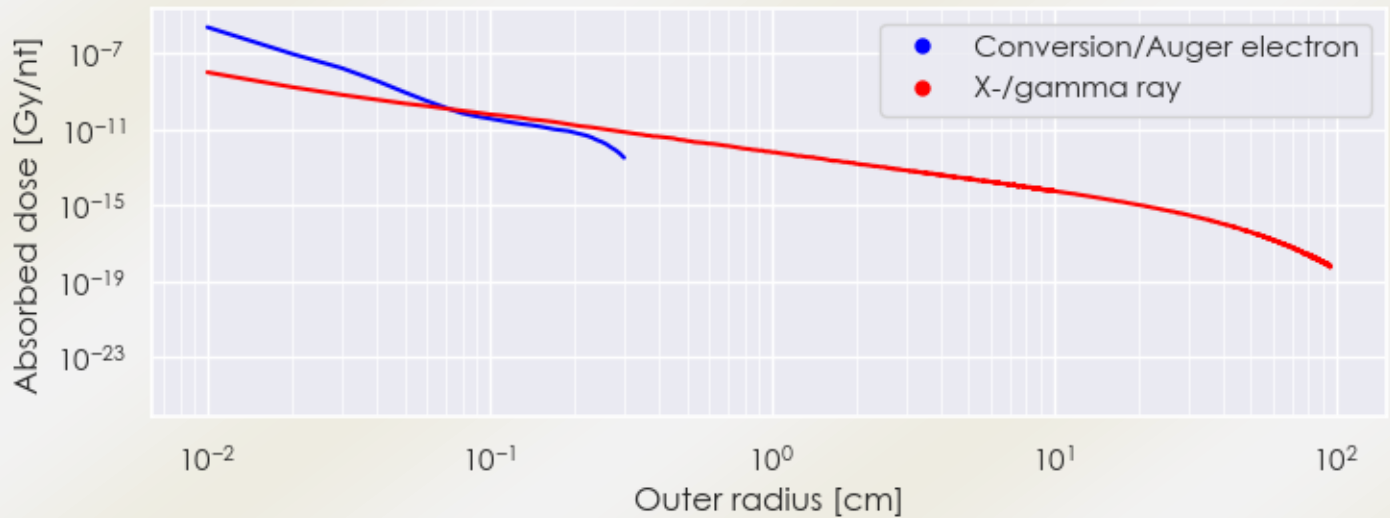
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta+, e-}$: 2.399×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.603×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

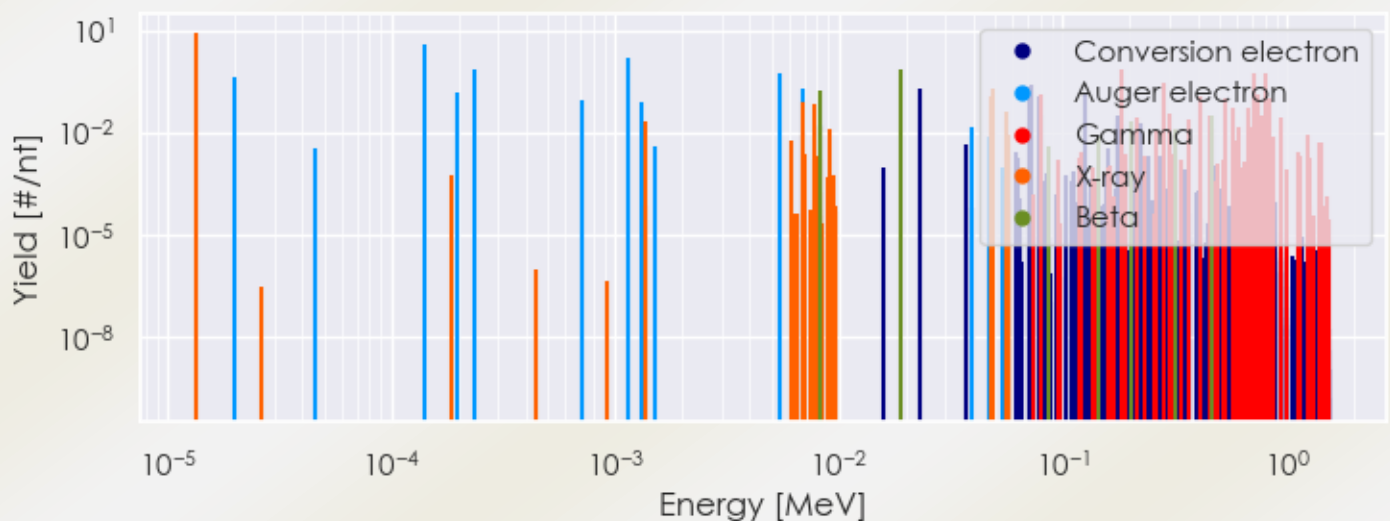
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ho-166m DPK.csv

SUMMARY SPECTRA (PLOT)

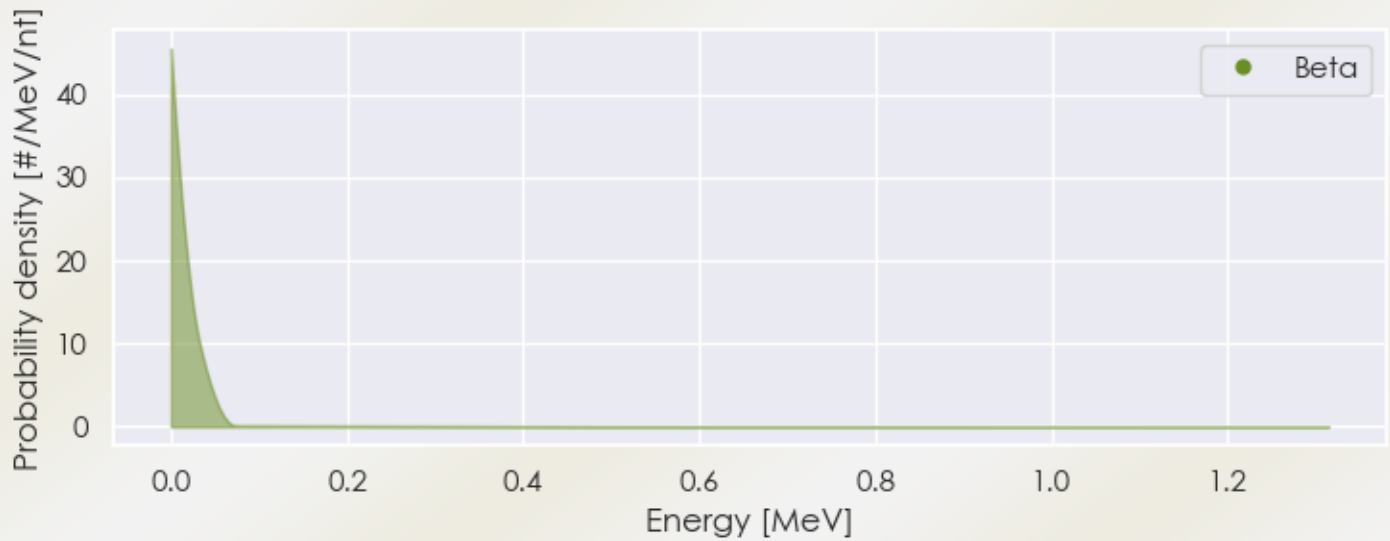
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ho-166m 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/Ho-166m 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/Ho-166m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.35308e-05	8.758e+00	X-ray
1.36716e-03	2.132e-02	X-ray
6.93539e-03	7.969e-02	X-ray
7.81979e-03	7.151e-02	X-ray
8.17512e-03	1.355e-02	X-ray
9.09455e-03	1.265e-02	X-ray
4.82994e-02	1.079e-01	X-ray
4.92265e-02	1.914e-01	X-ray
5.55821e-02	1.994e-02	X-ray

5.57778e-02	3.853e-02	X-ray
8.05860e-02	1.233e-01	Gamma
1.84410e-01	7.260e-01	Gamma
2.15890e-01	2.606e-02	Gamma
2.59737e-01	1.089e-02	Gamma
2.80459e-01	2.977e-01	Gamma
3.00762e-01	3.732e-02	Gamma
3.65747e-01	2.476e-02	Gamma
4.10944e-01	1.141e-01	Gamma
4.51521e-01	2.984e-02	Gamma
4.64797e-01	1.212e-02	Gamma
5.29801e-01	9.692e-02	Gamma
5.70990e-01	5.547e-02	Gamma
6.11550e-01	1.408e-02	Gamma
6.70502e-01	5.481e-02	Gamma
6.91249e-01	1.343e-02	Gamma
7.11683e-01	5.532e-01	Gamma
7.52285e-01	1.229e-01	Gamma
7.78817e-01	3.078e-02	Gamma
8.10276e-01	5.808e-01	Gamma
8.30577e-01	9.816e-02	Gamma
9.50967e-01	2.755e-02	Gamma
8.18596e-03	1.741e-01	Beta
1.88201e-02	7.513e-01	Beta
2.01454e-01	2.222e-02	Beta
3.16597e-01	1.190e-02	Beta
4.64223e-01	2.940e-02	Beta
1.98170e-05	4.205e-01	Auger electron
1.41562e-04	3.942e+00	Auger electron
1.98154e-04	1.393e-01	Auger electron
2.36653e-04	6.637e-01	Auger electron
7.15356e-04	9.029e-02	Auger electron
1.13429e-03	1.486e+00	Auger electron
1.30912e-03	7.369e-02	Auger electron
5.48159e-03	5.113e-01	Auger electron
6.85523e-03	1.823e-01	Auger electron
8.26055e-03	1.642e-02	Auger electron
2.30120e-02	2.022e-01	Conversion electron

3.94671e-02	1.423e-02	Auger electron
7.08698e-02	1.965e-02	Conversion electron
7.13112e-02	2.332e-01	Conversion electron
7.22386e-02	2.405e-01	Conversion electron
7.87898e-02	1.207e-01	Conversion electron
8.05860e-02	3.175e-02	Conversion electron
1.26836e-01	1.489e-01	Conversion electron
1.74694e-01	1.579e-02	Conversion electron
1.75135e-01	3.109e-02	Conversion electron
1.76063e-01	2.451e-02	Conversion electron
1.82614e-01	1.711e-02	Conversion electron
2.22885e-01	1.826e-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