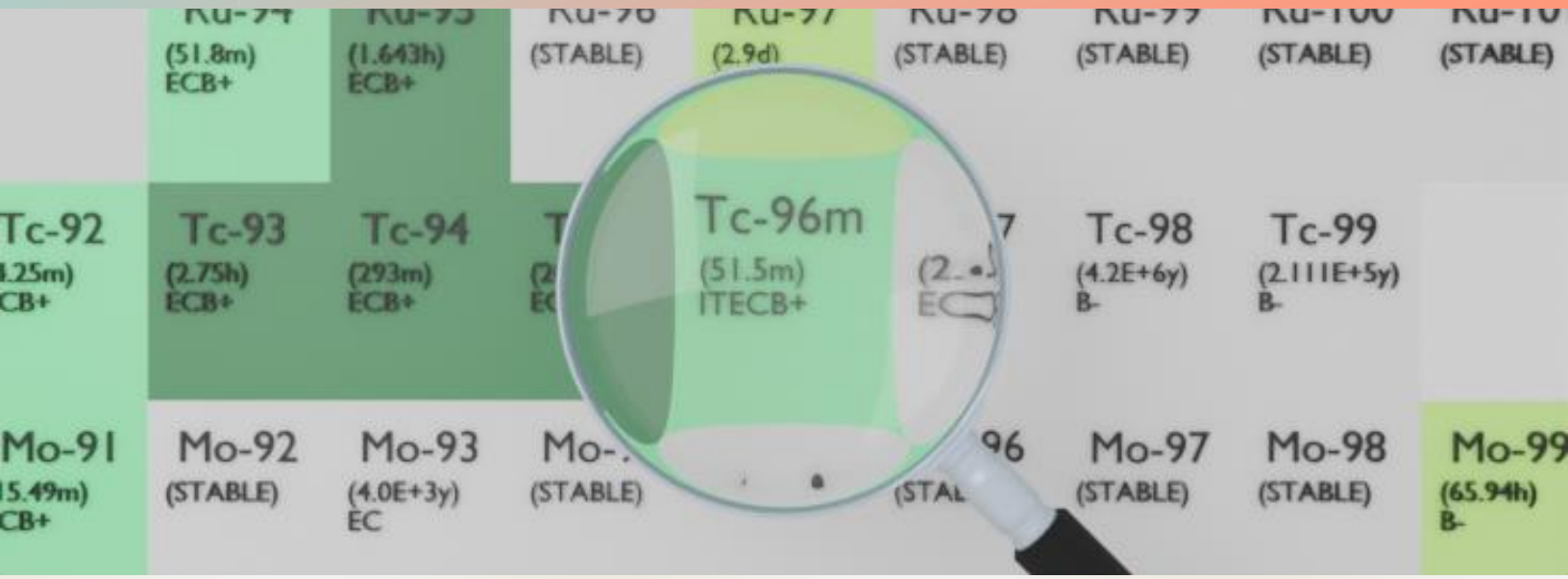


TECHNETIUM-96M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tc-96m
Atomic number (Z): 43
Mass number (A): 96
Neutron number (N): 53

RADIOACTIVE DECAY

Decay modes: β+, Electron capture, Internal transition
Half-life: 51.5 [m]
Decay constant: 2.2432e-04 [1/s]
Daughters: Tc-96 (98.0%), Mo-96 (2.0%)
Radioactive daughters: Tc-96

DOSIMETRIC CONSTANTS

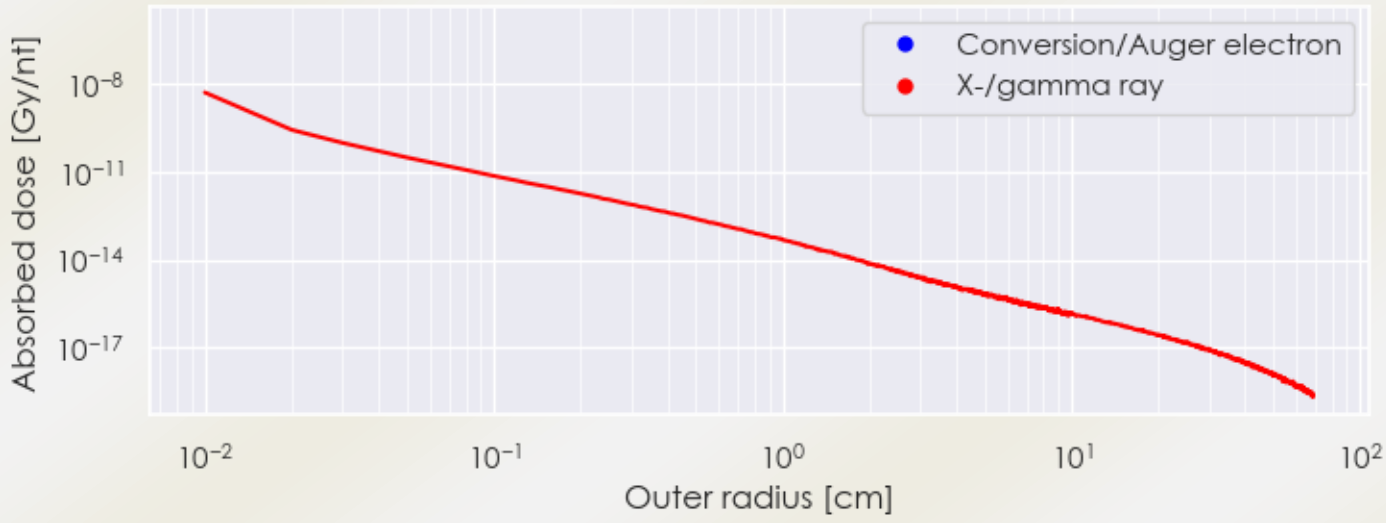
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.02689 [MeV]
Mean photon energy: 0.04799 [MeV]
Air kerma rate constant, Γ_{10}: 6.952e-18 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 6.953e-18 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 4.308e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}: 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 4.308e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 7.689e-15 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

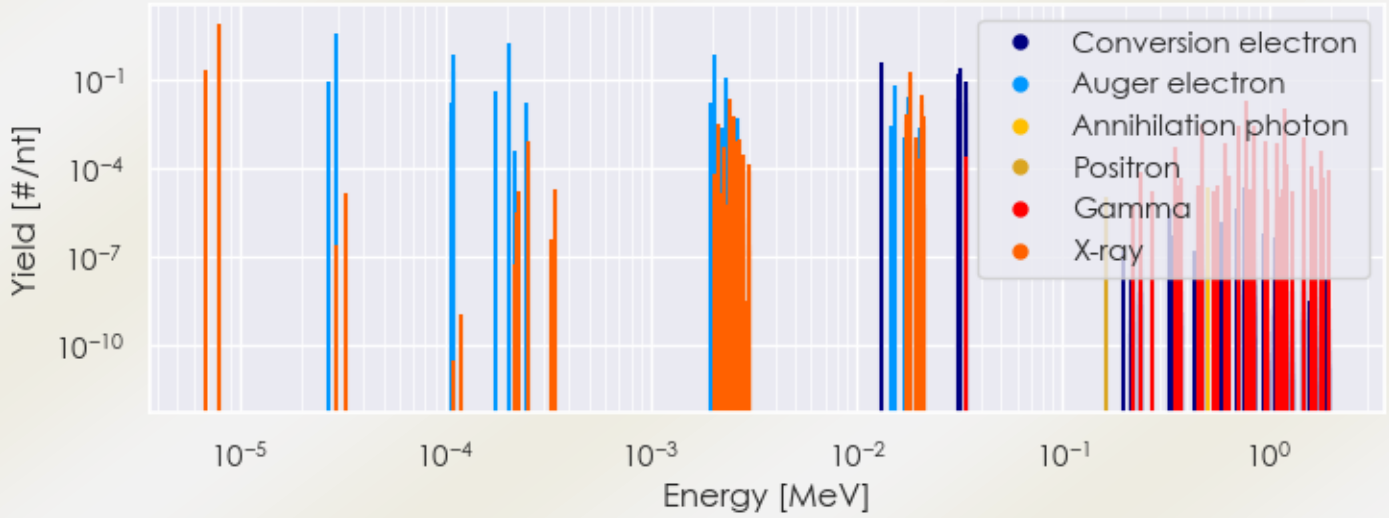
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tc-96m DPK.csv

SUMMARY SPECTRA (PLOT)

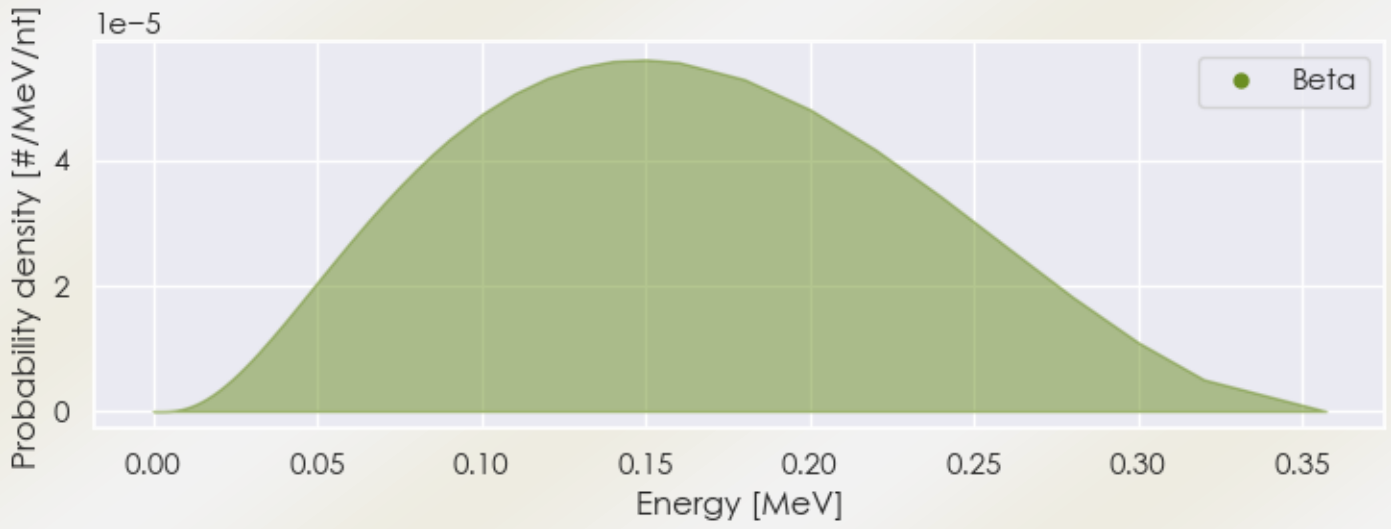
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tc-96m 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/Tc-96m 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/Tc-96m Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
6.84801e-06	2.022e-01	X-ray
7.87533e-06	8.405e+00	X-ray
2.41453e-03	2.139e-02	X-ray
1.82141e-02	9.448e-02	X-ray
1.83344e-02	1.796e-01	X-ray
2.05668e-02	1.485e-02	X-ray
2.05871e-02	2.891e-02	X-ray
7.78220e-01	1.874e-02	Gamma
1.20015e+00	1.078e-02	Gamma
2.73599e-05	9.366e-02	Auger electron

2.93724e-05	3.680e+00	Auger electron
1.06643e-04	1.781e-02	Auger electron
1.09204e-04	7.697e-01	Auger electron
1.09400e-04	1.926e-01	Auger electron
1.76249e-04	4.268e-02	Auger electron
2.04072e-04	1.858e+00	Auger electron
2.48185e-04	1.563e-02	Auger electron
1.95199e-03	1.699e-02	Auger electron
2.04731e-03	7.149e-01	Auger electron
2.32637e-03	1.112e-01	Auger electron
1.31880e-02	4.188e-01	Conversion electron
1.54229e-02	6.544e-02	Auger electron
1.78238e-02	2.472e-02	Auger electron
3.11776e-02	1.653e-01	Conversion electron
3.14021e-02	2.433e-02	Conversion electron
3.15224e-02	2.487e-01	Conversion electron
3.37751e-02	9.117e-02	Conversion electron
3.42000e-02	1.576e-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