



TECHNETIUM-94

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Tc-94
Atomic number (Z): 43
Mass number (A): 94
Neutron number (N): 51

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 293.0 [m]
Decay constant: $3.9428\text{e-}05$ [1/s]
Daughters: Mo-94 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.04754 [MeV]
Mean photon energy: 2.66077 [MeV]
Air kerma rate constant, Γ_{10} : $1.038\text{e-}16$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $1.080\text{e-}16$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $7.617\text{e-}15$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [Gy $\cdot$ kg/Bq $\cdot$ s]

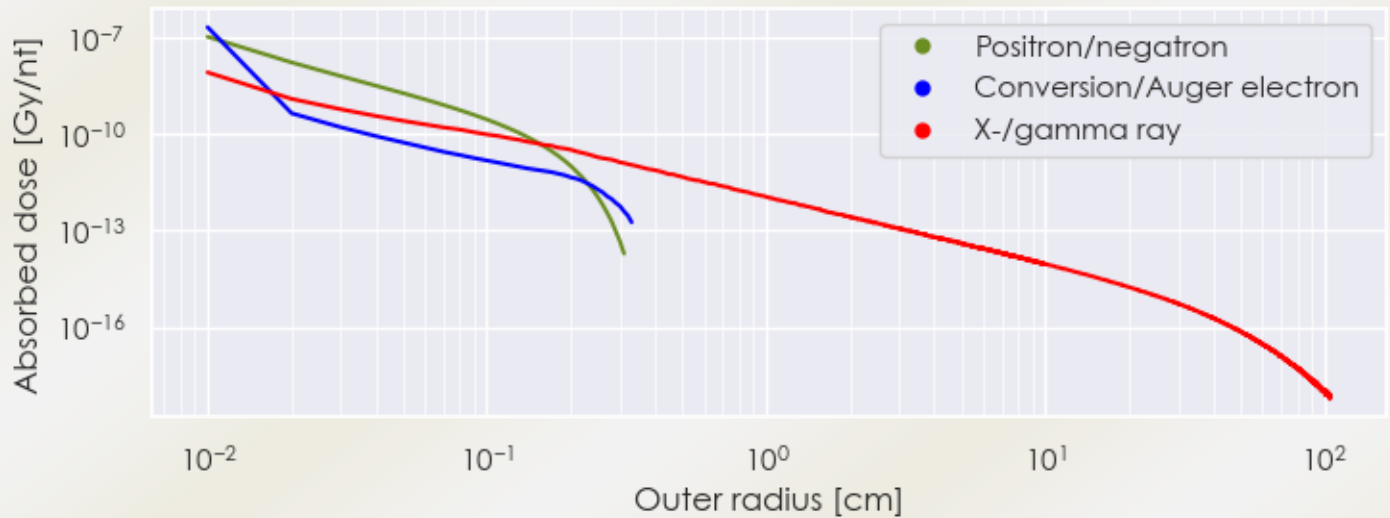
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-\beta+,e-}$: 7.617e-15 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.263e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

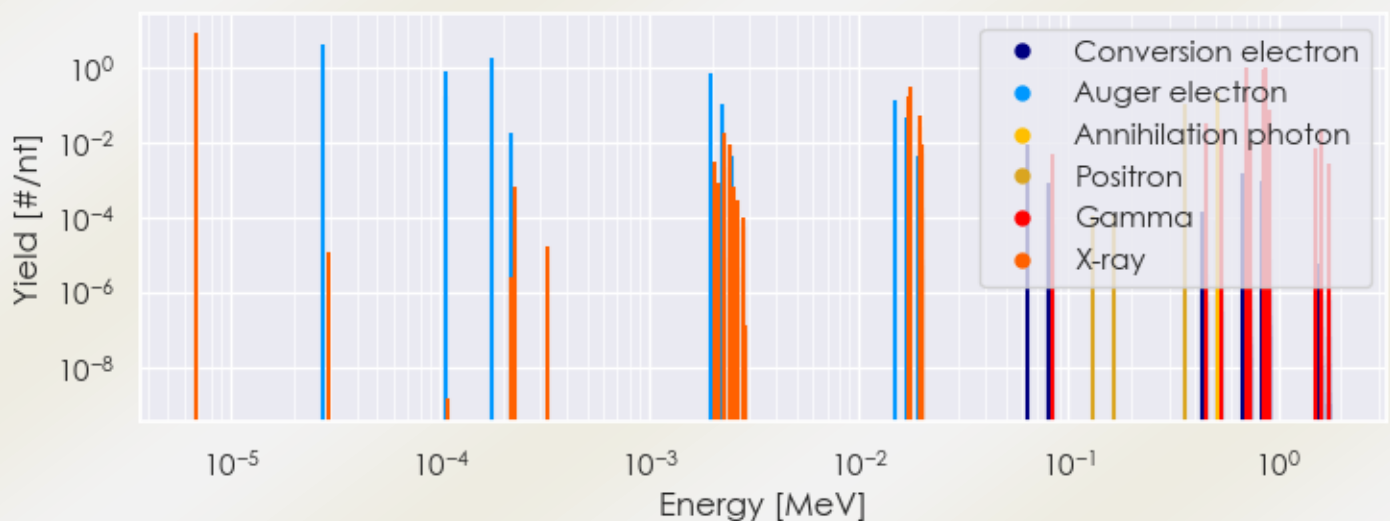
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Tc-94 DPK.csv

SUMMARY SPECTRA (PLOT)

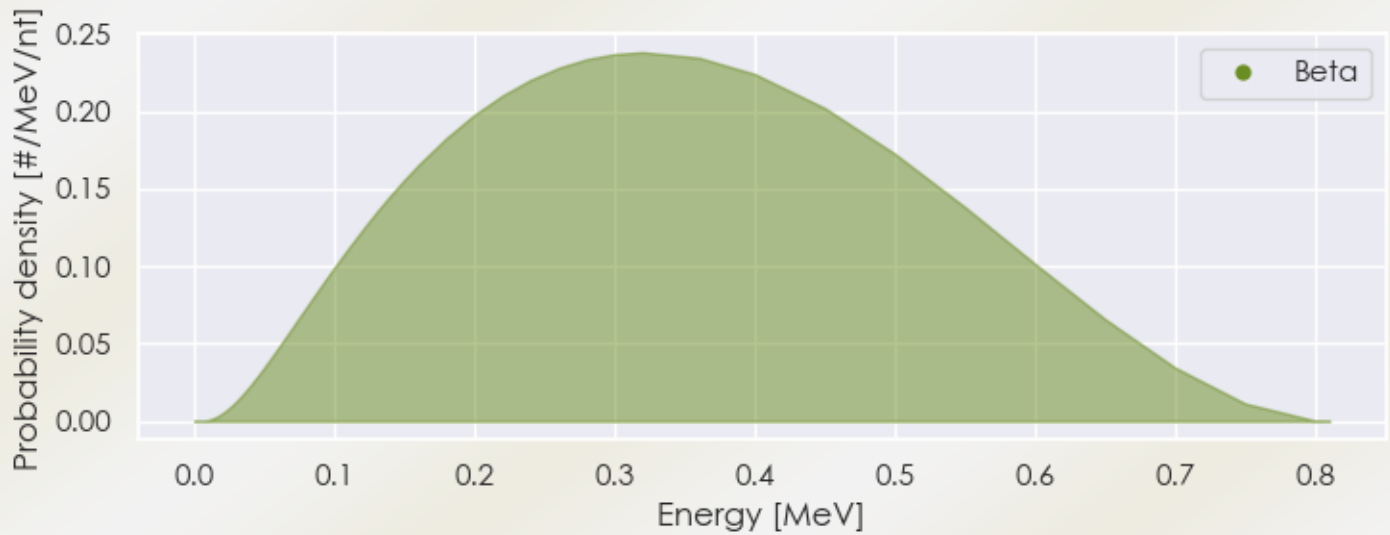
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Tc-94 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-94 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-94 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
6.84801e-06	9.159e+00	X-ray
2.28400e-03	1.891e-02	X-ray
1.73355e-02	1.744e-01	X-ray
1.74440e-02	3.324e-01	X-ray
1.95554e-02	2.708e-02	X-ray
1.95734e-02	5.272e-02	X-ray
4.49200e-01	3.297e-02	Gamma
5.11000e-01	2.139e-01	Annihilation photon
5.32100e-01	2.348e-02	Gamma
7.02670e-01	9.960e-01	Gamma

7.42300e-01	1.209e-02	Gamma
8.49740e-01	9.570e-01	Gamma
8.71050e-01	9.990e-01	Gamma
9.16100e-01	7.592e-02	Gamma
1.59210e+00	2.248e-02	Gamma
3.58333e-01	1.067e-01	Positron
2.73605e-05	4.242e+00	Auger electron
1.06670e-04	8.070e-01	Auger electron
1.06780e-04	1.790e-01	Auger electron
1.76244e-04	1.933e+00	Auger electron
2.18172e-04	1.852e-02	Auger electron
1.95195e-03	7.700e-01	Auger electron
2.20125e-03	1.091e-01	Auger electron
1.47064e-02	1.330e-01	Auger electron
1.69714e-02	4.925e-02	Auger 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