



(STABLE)	(4.0E+3y) EC	(STABLE)	(STABLE)	(STABLE)	(STABLE)	(STABLE)	(65.94h) B-
Nb-91 (580y) EC+	Nb-92 (3.47E+7y) EC	Nb-93 (STABLE)	Nb-94 (2.03E+6y) B-	Nb-95m (3.61d) ITB-	Nb-96 (35.1d) B-	Nb-97 (72.1m) B-	Nb-99 (15.0s) B-
Zr-90 (STABLE)	Zr-91 (STABLE)	Zr-92 (STABLE)	Zr-93 (1.53E+6y) B-	Zr-94 (64.0d) B-	Zr-95 (64.0d) B-	Zr-97 (16.744h) B-	

NIOBIUM-95M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Nb-95m
Atomic number (Z): 41
Mass number (A): 95
Neutron number (N): 54

RADIOACTIVE DECAY

Decay modes: β^- , Internal transition
Half-life: 3.61 [d]
Decay constant: 2.2223e-06 [1/s]
Daughters: Nb-95 (94.4%), Mo-95 (5.6%)
Radioactive daughters: Nb-95

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.17998 [MeV]
Mean photon energy: 0.06967 [MeV]
Air kerma rate constant, Γ_{10} : 1.056e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 1.056e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.884e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

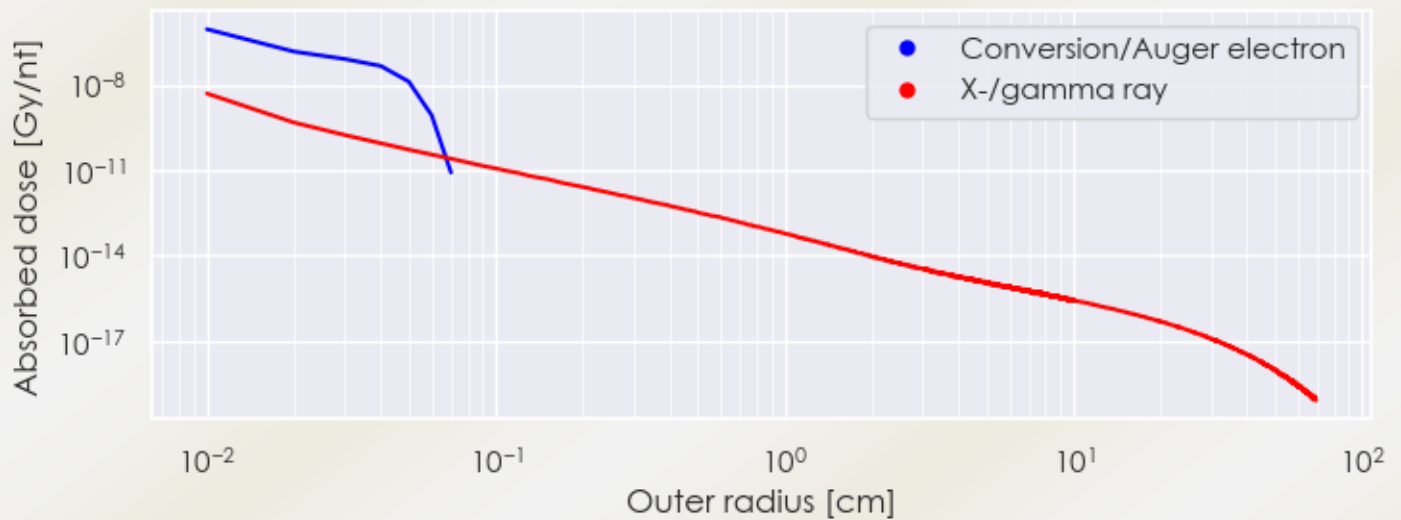
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 2.884×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.116×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

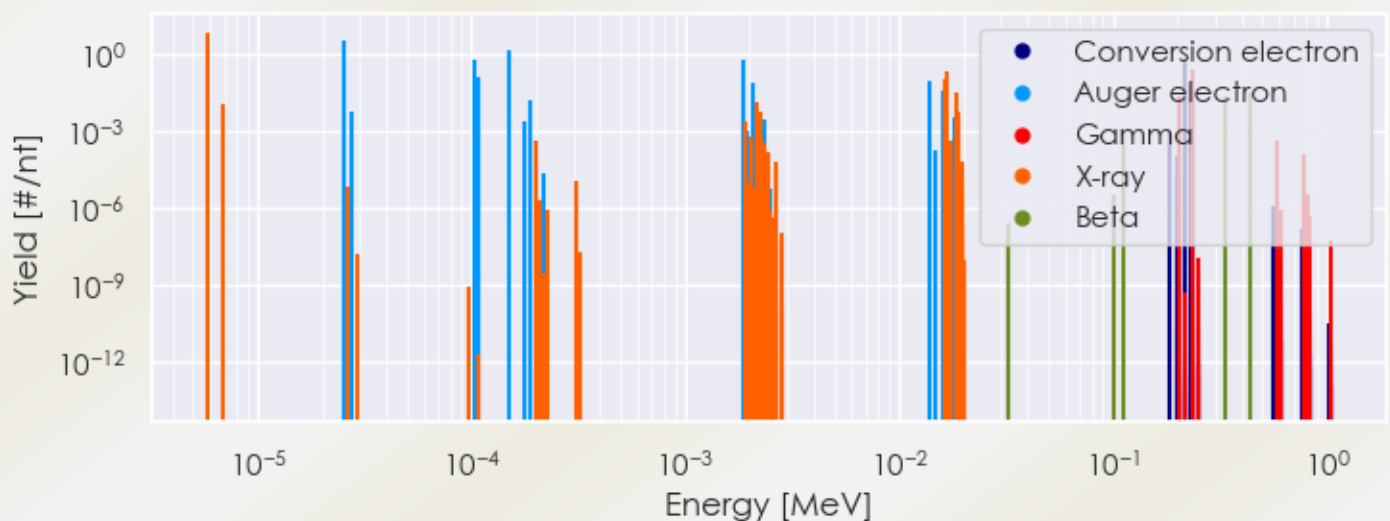
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Nb-95m DPK.csv

SUMMARY SPECTRA (PLOT)

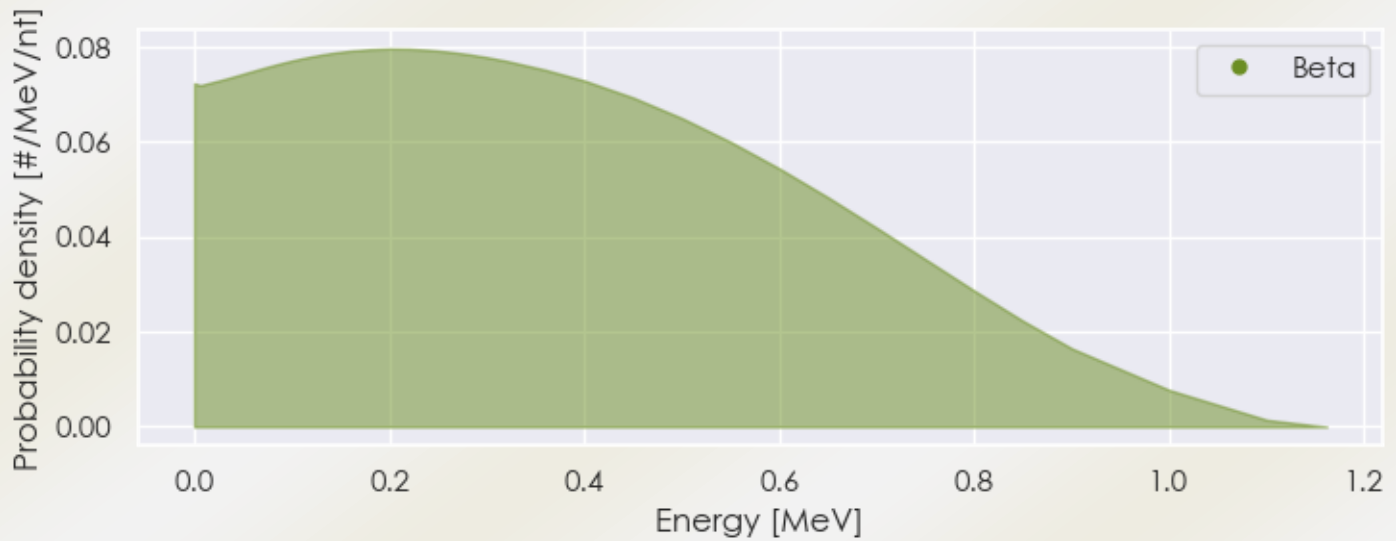
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Nb-95m 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/Nb-95m 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/Nb-95m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
5.83034e-06	7.526e+00	X-ray
6.84806e-06	1.206e-02	X-ray
2.15729e-03	1.341e-02	X-ray
1.64814e-02	1.217e-01	X-ray
1.65789e-02	2.324e-01	X-ray
1.85728e-02	1.863e-02	X-ray
1.85887e-02	3.628e-02	X-ray
2.04116e-01	2.296e-02	Gamma
2.35690e-01	2.437e-01	Gamma

3.34913e-01	2.370e-02	Beta
4.37755e-01	3.160e-02	Beta
2.53252e-05	3.706e+00	Auger electron
1.03504e-04	6.347e-01	Auger electron
1.07798e-04	1.397e-01	Auger electron
1.48957e-04	1.502e+00	Auger electron
1.89187e-04	1.654e-02	Auger electron
1.85287e-03	6.038e-01	Auger electron
2.07372e-03	7.731e-02	Auger electron
1.40095e-02	1.023e-01	Auger electron
1.61428e-02	3.712e-02	Auger electron
2.16742e-01	5.614e-01	Conversion electron
2.33014e-01	7.789e-02	Conversion electron
2.33223e-01	1.278e-02	Conversion electron
2.33321e-01	2.340e-02	Conversion electron
2.35331e-01	2.128e-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