



SI-77 (2.25m) ECB+	SI-80 (106.3m) ECB+	SI-81 (22.3m) ECB+	SI-82 (25.36d) EC	SI-83 (32.41h) ECB+	
F-18 (110m) EC	Rb-78m (5.74m) ECB+IT	Rb-79 (2.36h) EC	Rb-80 (33.4s) ECB+	Rb-81 (4.576h) ECB+	Rb-82 (1.273m) ECB+
Kr-74 (11.50m) ECB+	Kr-75 (4.29m) ECB+	Kr-76 (14.8h) EC	Kr-79 (35.04h) ECB+	Kr-80 (STABLE)	Kr-81 (2.29E+5y) EC

RUBIDIUM-78M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Rb-78m
Atomic number (Z): 37
Mass number (A): 78
Neutron number (N): 41

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture, Internal transition
Half-life: 5.74 [m]
Decay constant: 2.0126e-03 [1/s]
Daughters: Rb-78 (10.0%), Kr-78 (90.0%)
Radioactive daughters: Rb-78

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.49924 [MeV]
Mean photon energy: 3.21486 [MeV]
Air kerma rate constant, Γ_{10} : 7.911e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 1.127e-16 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.402e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

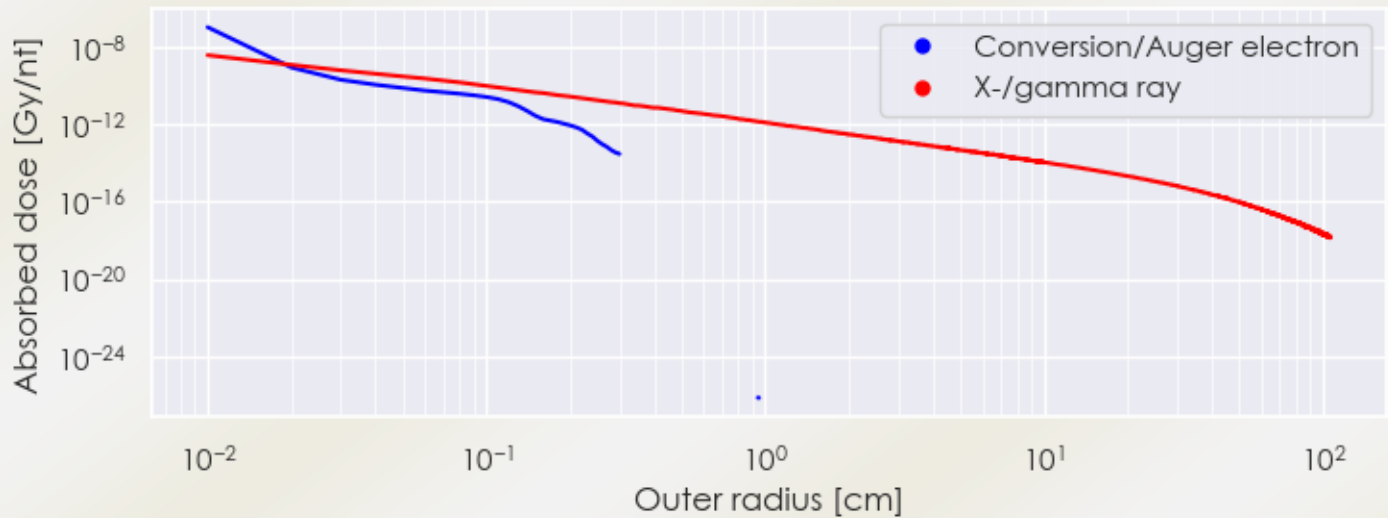
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 2.402×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.151×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

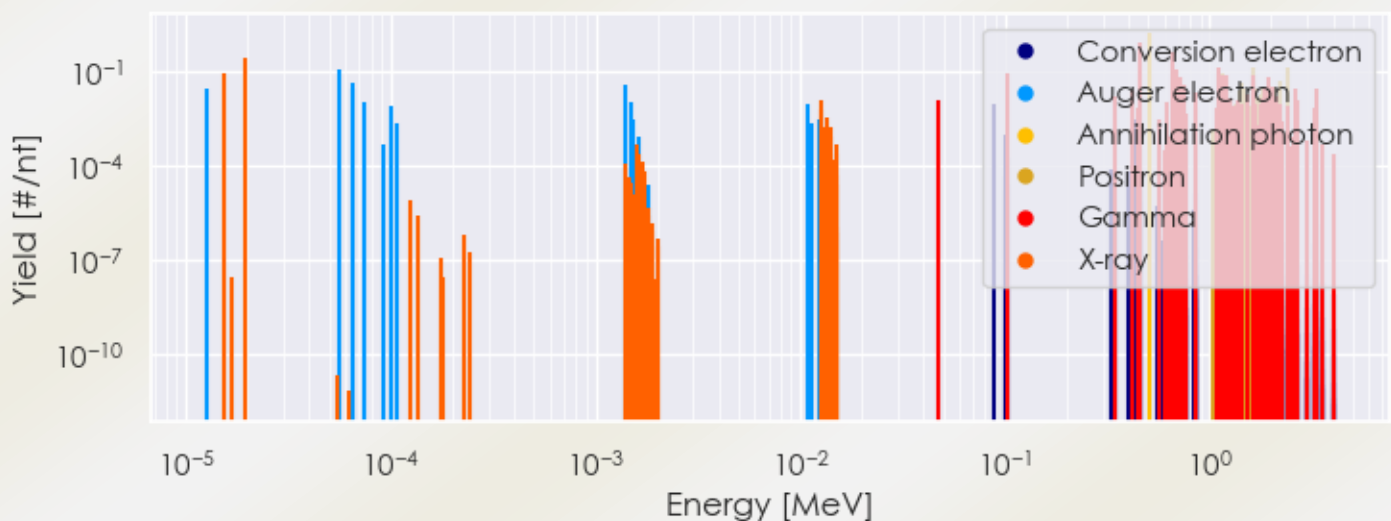
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Rb-78m DPK.csv

SUMMARY SPECTRA (PLOT)

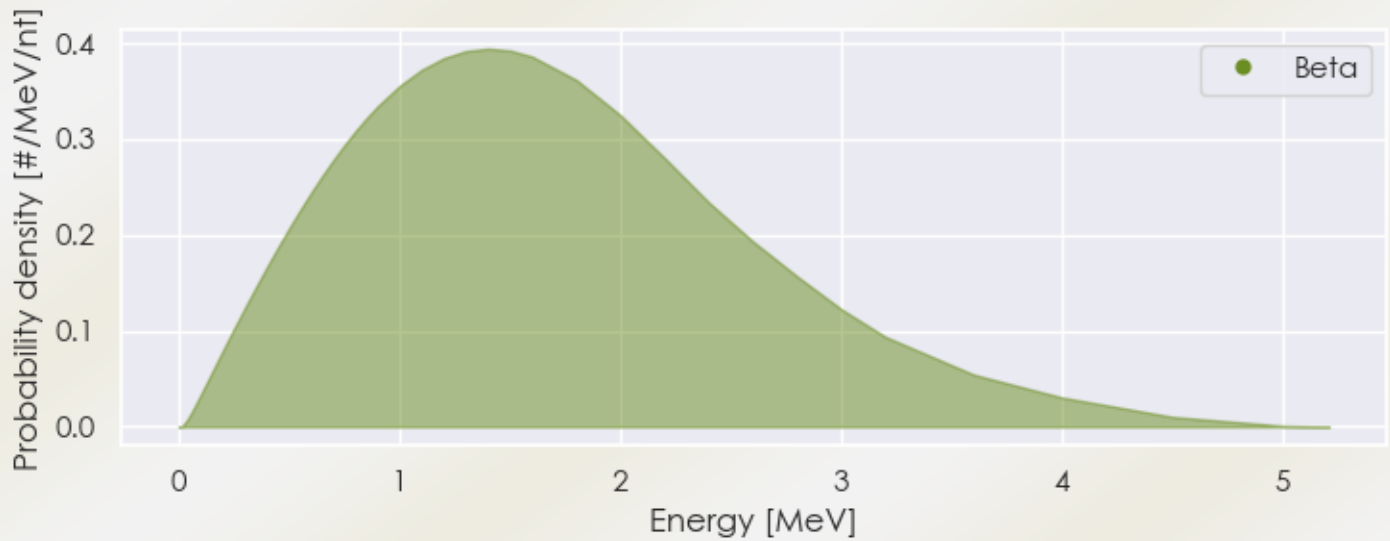
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Rb-78m 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/Rb-78m 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/Rb-78m Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.52787e-05	8.951e-02	X-ray
1.93808e-05	2.508e-01	X-ray
1.26066e-02	1.185e-02	X-ray
4.71000e-02	1.184e-02	Gamma
1.03300e-01	9.028e-02	Gamma
3.41260e-01	1.523e-02	Gamma
4.16770e-01	2.284e-02	Gamma
4.54990e-01	8.100e-01	Gamma
5.11000e-01	1.735e+00	Annihilation photon

6.11370e-01	1.021e-02	Gamma
6.64420e-01	3.831e-01	Gamma
6.92880e-01	1.226e-01	Gamma
7.25060e-01	6.237e-02	Gamma
7.34980e-01	1.482e-02	Gamma
7.53370e-01	3.896e-02	Gamma
8.58330e-01	2.001e-02	Gamma
1.10972e+00	1.312e-01	Gamma
1.14787e+00	7.752e-02	Gamma
1.19933e+00	7.201e-02	Gamma
1.23244e+00	1.328e-02	Gamma
1.26563e+00	1.247e-02	Gamma
1.27017e+00	1.353e-02	Gamma
1.37561e+00	1.223e-02	Gamma
1.52981e+00	1.774e-02	Gamma
1.63028e+00	4.957e-02	Gamma
1.64461e+00	7.096e-02	Gamma
1.79625e+00	1.337e-02	Gamma
1.85255e+00	3.078e-02	Gamma
1.87987e+00	1.385e-02	Gamma
1.94397e+00	6.747e-02	Gamma
1.95291e+00	1.717e-02	Gamma
2.01325e+00	3.143e-02	Gamma
2.11828e+00	1.669e-02	Gamma
2.62686e+00	2.843e-02	Gamma
2.65497e+00	1.166e-02	Gamma
3.31950e+00	2.892e-02	Gamma
1.14485e+00	8.799e-02	Positron
1.16786e+00	3.800e-02	Positron
1.19426e+00	3.310e-02	Positron
1.39969e+00	2.280e-02	Positron
1.43399e+00	4.410e-02	Positron
1.46047e+00	2.730e-02	Positron
1.47611e+00	1.650e-02	Positron
1.51083e+00	1.340e-02	Positron
1.62291e+00	1.240e-01	Positron
1.62975e+00	4.240e-02	Positron
1.66420e+00	2.630e-02	Positron

1.71408e+00	1.360e-02	Positron
1.79067e+00	1.900e-02	Positron
1.79759e+00	3.060e-02	Positron
1.84521e+00	2.130e-02	Positron
2.05069e+00	3.400e-02	Positron
2.11232e+00	1.370e-02	Positron
2.19956e+00	4.800e-02	Positron
2.40259e+00	1.700e-02	Positron
2.41480e+00	1.280e-01	Positron
1.26043e-05	2.623e-02	Auger electron
5.62870e-05	1.096e-01	Auger electron
6.49860e-05	2.631e-02	Auger electron
6.55281e-05	4.311e-02	Auger electron
7.35529e-05	1.061e-02	Auger electron
1.40731e-03	3.830e-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