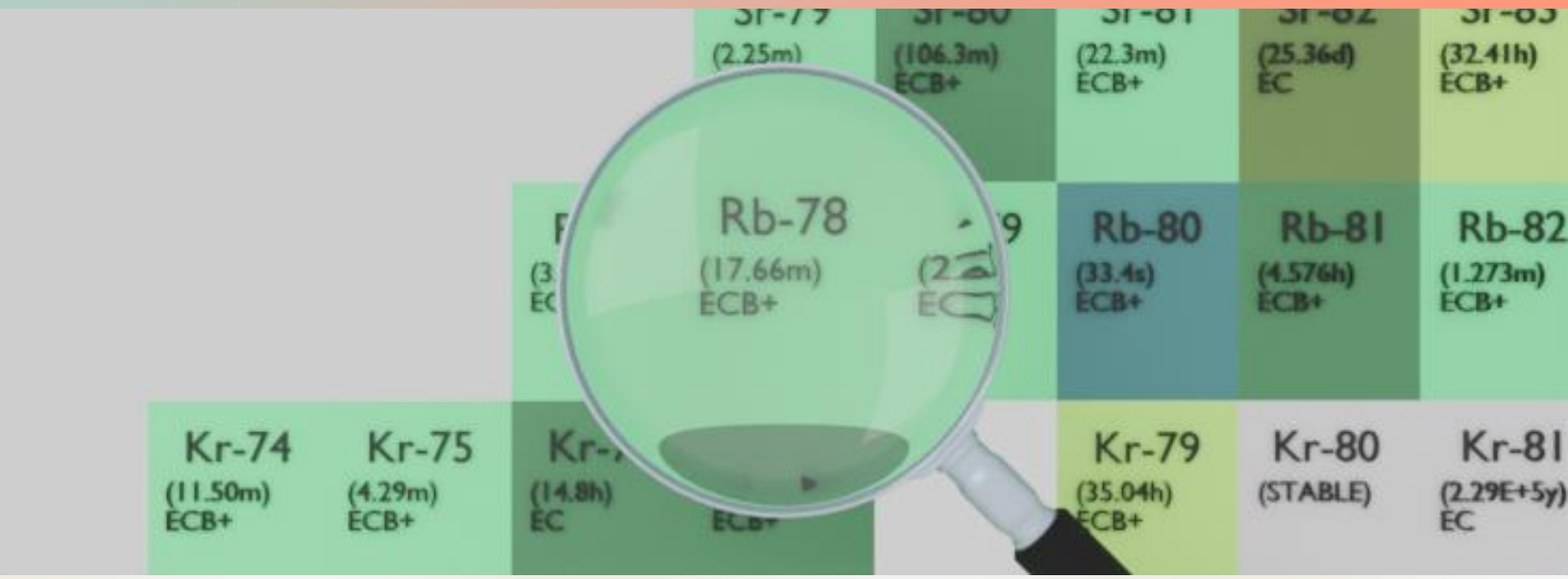


RUBIDIUM-78

SUMMARY DATA

GENERAL

CLASSIFICATION

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

RADIOACTIVE DECAY

Decay modes: β+, Electron capture
Half-life: 17.66 [m]
Decay constant: 6.5416e-04 [1/s]
Daughters: Kr-78 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

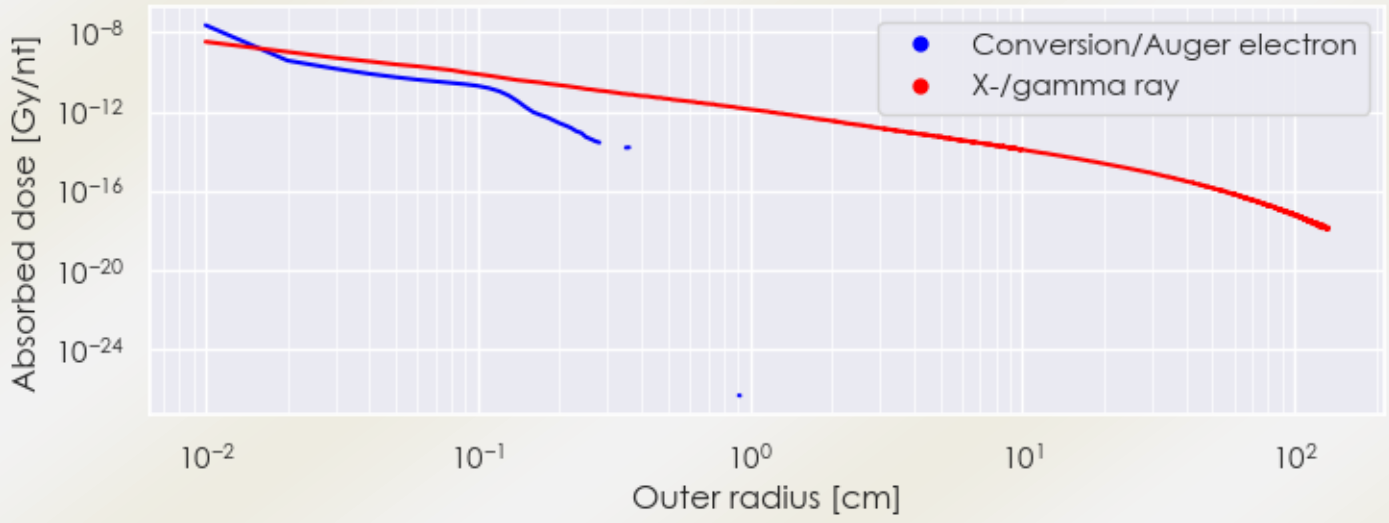
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.28892 [MeV]
Mean photon energy: 4.09184 [MeV]
Air kerma rate constant, Γ_{10}*:* 9.284e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air}*:* 1.273e-16 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}*:* 2.065e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}*:* 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 2.065e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 6.556e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

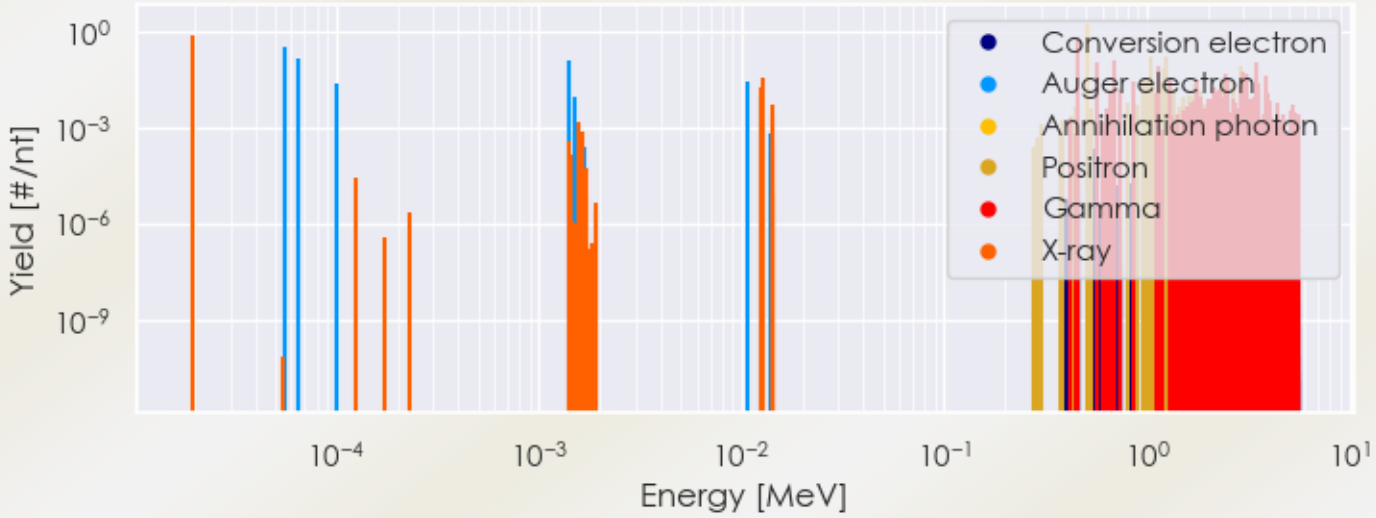
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



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

SUMMARY SPECTRA (PLOT)

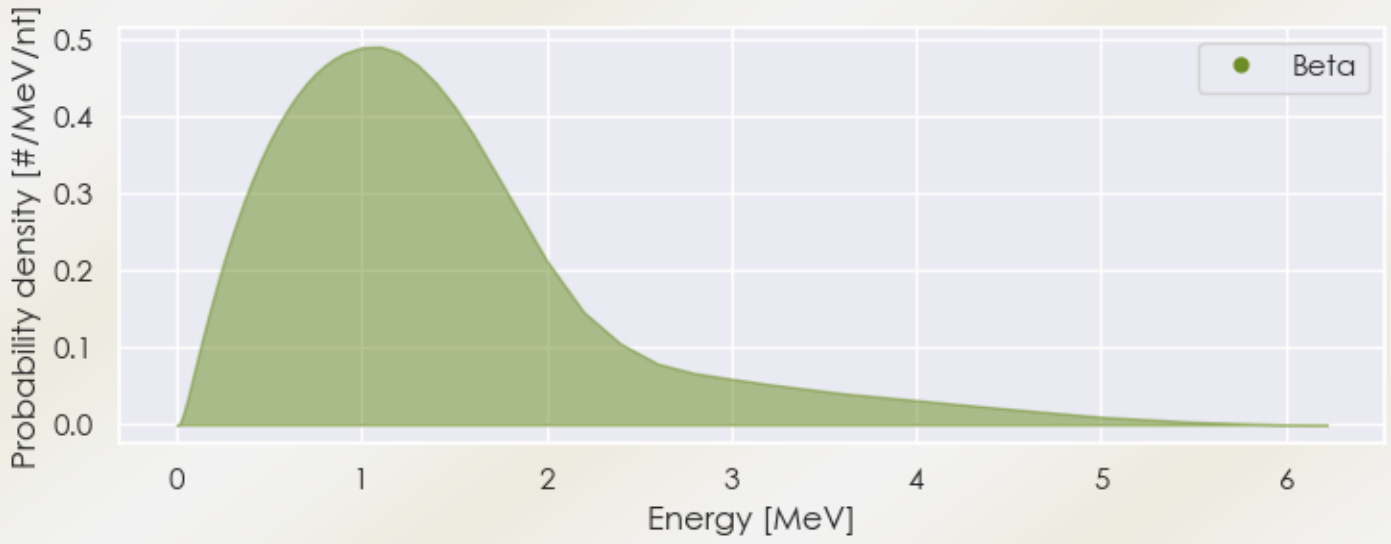
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



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

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
1.93809e-05	7.692e-01	X-ray
1.25517e-02	1.883e-02	X-ray
1.26066e-02	3.631e-02	X-ray
4.54990e-01	6.270e-01	Gamma
5.11000e-01	1.779e+00	Annihilation photon
5.62150e-01	1.141e-01	Gamma
6.64420e-01	1.166e-02	Gamma
6.92880e-01	1.256e-01	Gamma
7.38660e-01	1.655e-02	Gamma
8.59560e-01	2.840e-02	Gamma

1.10972e+00	1.198e-02	Gamma
1.14787e+00	7.906e-02	Gamma
1.30083e+00	3.204e-02	Gamma
1.77911e+00	2.959e-02	Gamma
2.13741e+00	1.743e-02	Gamma
2.24069e+00	1.361e-02	Gamma
2.28966e+00	1.517e-02	Gamma
2.42027e+00	4.602e-02	Gamma
2.51413e+00	3.311e-02	Gamma
2.89236e+00	2.138e-02	Gamma
2.94140e+00	1.166e-02	Gamma
2.98237e+00	5.192e-02	Gamma
3.08395e+00	4.671e-02	Gamma
3.43738e+00	4.514e-02	Gamma
3.43816e+00	1.078e-01	Gamma
3.53900e+00	1.818e-02	Gamma
3.57499e+00	2.433e-02	Gamma
3.89315e+00	3.812e-02	Gamma
3.93750e+00	1.116e-02	Gamma
9.47950e-01	2.671e-02	Positron
9.70610e-01	3.390e-02	Positron
9.85721e-01	2.054e-02	Positron
1.01833e+00	3.081e-02	Positron
1.03894e+00	1.633e-01	Positron
1.06867e+00	2.773e-02	Positron
1.14683e+00	3.687e-02	Positron
1.18765e+00	2.609e-02	Positron
1.20456e+00	6.676e-02	Positron
1.25235e+00	1.530e-01	Positron
1.34995e+00	1.613e-02	Positron
1.62280e+00	1.027e-02	Positron
1.72449e+00	2.434e-02	Positron
1.82164e+00	1.397e-02	Positron
2.35080e+00	3.287e-02	Positron
2.41193e+00	2.054e-02	Positron
2.68320e+00	2.465e-02	Positron
2.90765e+00	8.217e-02	Positron
5.62891e-05	3.363e-01	Auger electron

6.55309e-05	1.323e-01	Auger electron
9.99031e-05	2.501e-02	Auger electron
1.40733e-03	1.174e-01	Auger electron
1.07980e-02	2.685e-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