



RUBIDIUM-77

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Rb-77
Atomic number (Z): 37
Mass number (A): 77
Neutron number (N): 40

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 3.77 [m]
Decay constant: $3.0643\text{e-}03$ [1/s]
Daughters: Kr-77 (100.0%)
Radioactive daughters: Kr-77

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.68653 [MeV]
Mean photon energy: 1.54522 [MeV]
Air kerma rate constant, Γ_{10} : $2.408\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Air kerma coefficient, K_{air} : $6.136\text{e-}17$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $2.702\text{e-}13$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]
Equilibrium dose constant for alphas, Δ_{α} : $0.000\text{e+}00$ [$\text{Gy} \cdot \text{kg}/\text{Bq} \cdot \text{s}$]

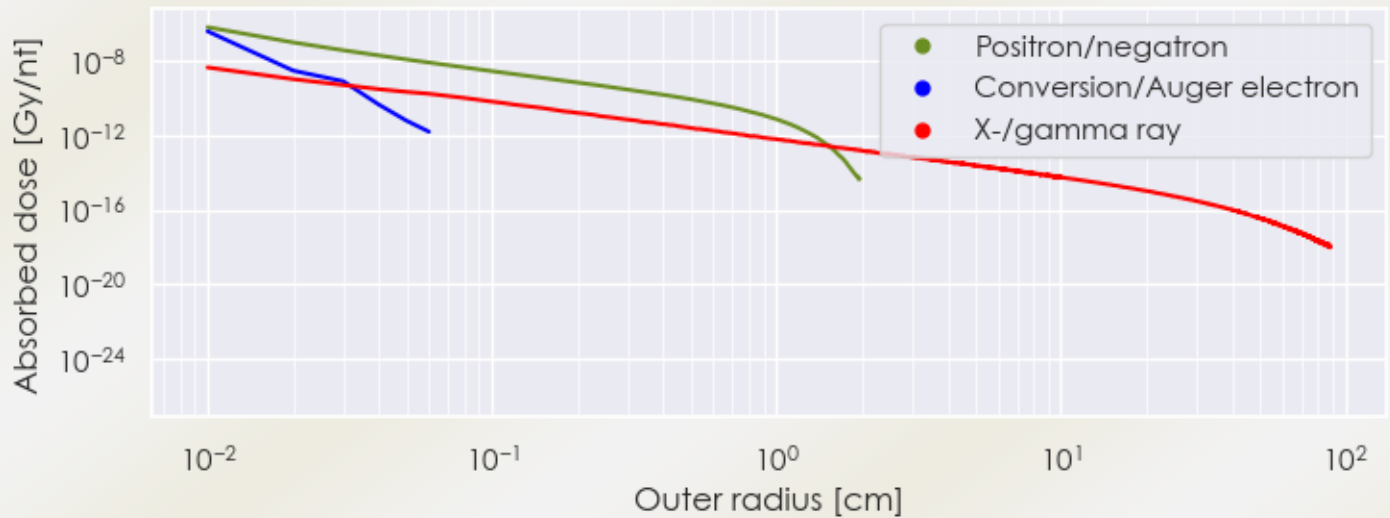
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 2.702×10^{-13} [Gy · kg/Bq · s]

Equilibrium dose constant for photons, Δ_p : 2.476×10^{-13} [Gy · kg/Bq · s]

DOSE POINT KERNELS (PLOT)

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

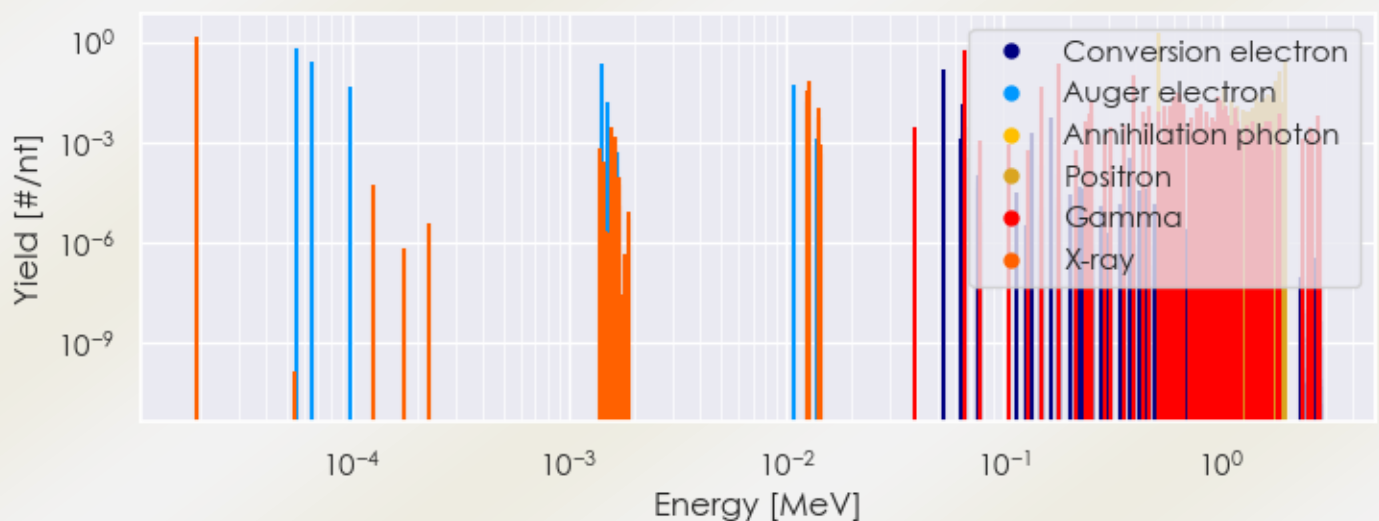
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Rb-77 DPK.csv

SUMMARY SPECTRA (PLOT)

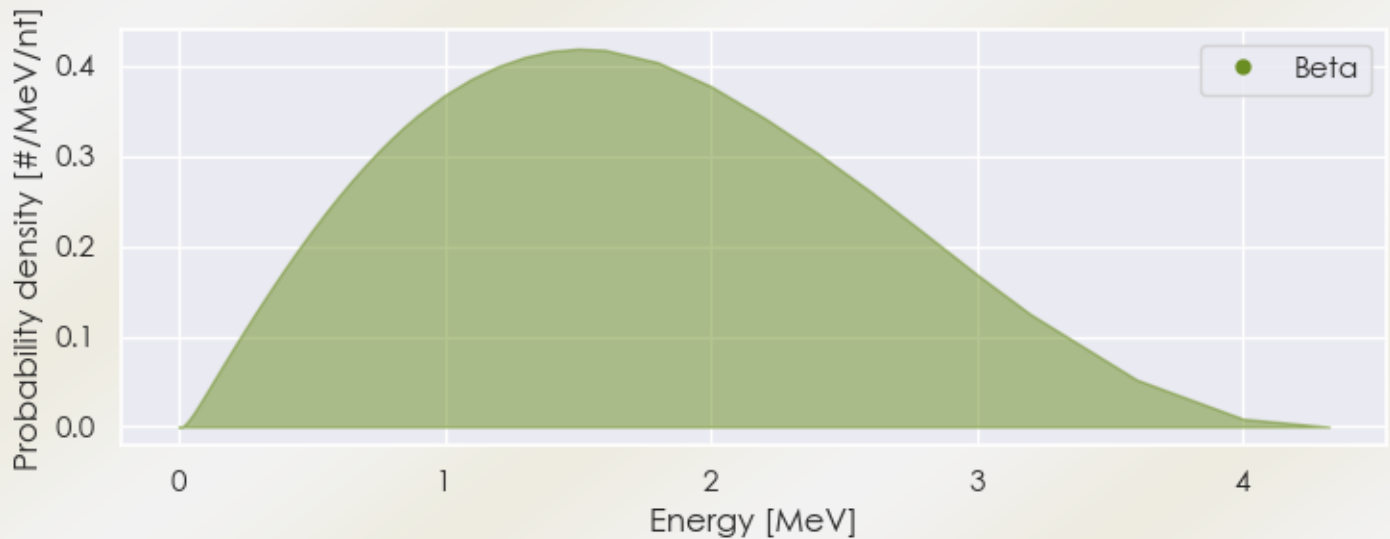
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Rb-77 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-77 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-77 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.93797e-05	1.487e+00	X-ray
1.25517e-02	3.673e-02	X-ray
1.26066e-02	7.083e-02	X-ray
1.40730e-02	1.008e-02	X-ray
6.65200e-02	5.700e-01	Gamma
1.49930e-01	4.332e-02	Gamma
1.78780e-01	2.217e-01	Gamma
2.54300e-01	1.778e-02	Gamma
3.93370e-01	9.747e-02	Gamma
4.68990e-01	1.186e-02	Gamma

5.11000e-01	1.926e+00	Annihilation photon
5.45230e-01	1.140e-02	Gamma
5.77200e-01	1.197e-02	Gamma
6.08600e-01	2.451e-02	Gamma
6.26690e-01	3.192e-02	Gamma
6.47880e-01	2.565e-02	Gamma
6.66800e-01	1.368e-02	Gamma
7.79800e-01	1.083e-02	Gamma
8.05600e-01	1.425e-02	Gamma
9.58700e-01	1.545e-02	Gamma
9.70870e-01	2.348e-02	Gamma
9.88270e-01	1.750e-02	Gamma
9.88270e-01	1.750e-02	Gamma
1.03743e+00	1.186e-02	Gamma
1.15379e+00	1.072e-02	Gamma
1.02523e+00	3.773e-02	Positron
1.11258e+00	1.787e-02	Positron
1.19026e+00	1.211e-02	Positron
1.39269e+00	1.092e-02	Positron
1.43482e+00	1.092e-02	Positron
1.45642e+00	2.681e-02	Positron
1.49025e+00	1.191e-02	Positron
1.49625e+00	1.390e-02	Positron
1.50186e+00	1.589e-02	Positron
1.56896e+00	2.085e-02	Positron
1.60780e+00	1.291e-02	Positron
1.64416e+00	2.780e-02	Positron
1.66296e+00	2.284e-02	Positron
1.75733e+00	1.589e-02	Positron
1.76589e+00	7.049e-02	Positron
1.86886e+00	1.261e-01	Positron
1.92263e+00	1.489e-02	Positron
1.95485e+00	2.681e-01	Positron
1.98687e+00	1.489e-01	Positron
5.62679e-05	6.506e-01	Auger electron
6.55008e-05	2.553e-01	Auger electron
9.91466e-05	4.589e-02	Auger electron
1.40701e-03	2.282e-01	Auger electron

1.51163e-03	1.648e-02	Auger electron
1.07980e-02	5.238e-02	Auger electron
1.23371e-02	1.662e-02	Auger electron
5.22400e-02	1.526e-01	Conversion electron
6.46177e-02	1.407e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6