



Br-74 (25.4m) CB+	Br-75 (96.7m) ECB+	Br-76 (16.2h) ECB+	Br-77 (35.04h) ECB+	Br-78 (6.46m) ECB+B-	Br-79 (35.04h) ECB+	Br-80 (17.68m) B-ECB+	Br-81 (STABLE)	Br-82 (35.30h) B-
Se-73 (7.15h) CB+	Se-74 (STABLE)	Se-75 (119.779d) EC	Se-76 (STABLE)	Se-77 (STABLE)	Se-78 (STABLE)	Se-79 (2.95E+5y) B-	Se-80 (STABLE)	Se-81 (18.45m) B-

BROMINE-78

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Br-78
Atomic number (Z): 35
Mass number (A): 78
Neutron number (N): 43

RADIOACTIVE DECAY

Decay modes: β^- , β^+ , Electron capture
Half-life: 6.46 [m]
Decay constant: 1.7883e-03 [1/s]
Daughters: Se-78 (100.0%), Kr-78 (0.01%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 1.02345 [MeV]
Mean photon energy: 1.03361 [MeV]
Air kerma rate constant, Γ_{10} : 5.115e-18 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 4.091e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.640e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

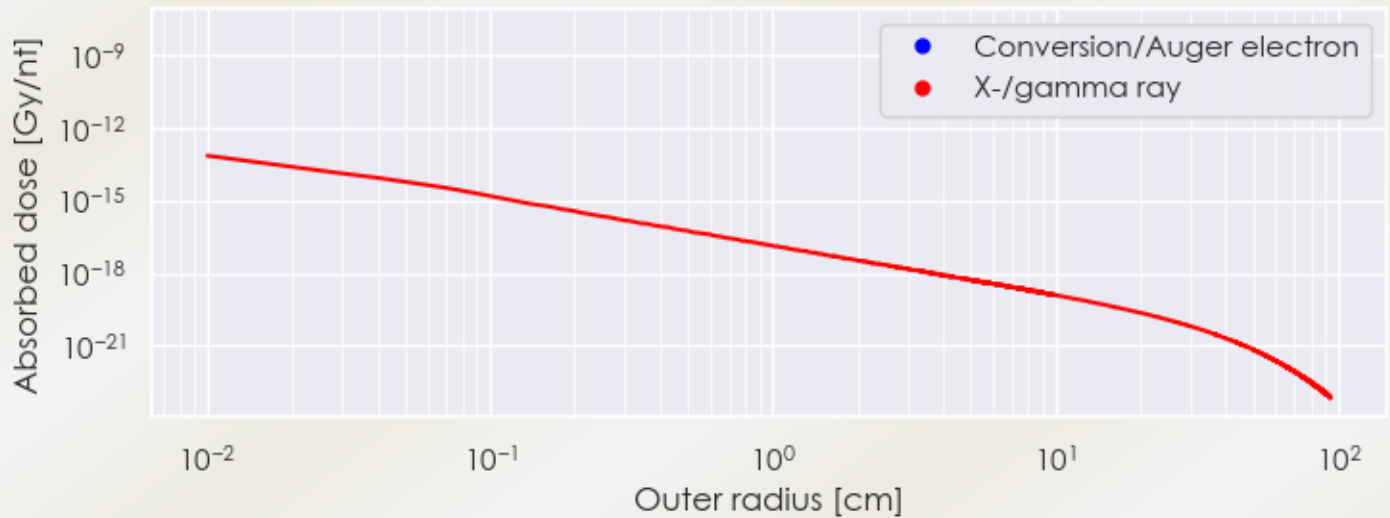
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 1.640×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.656×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

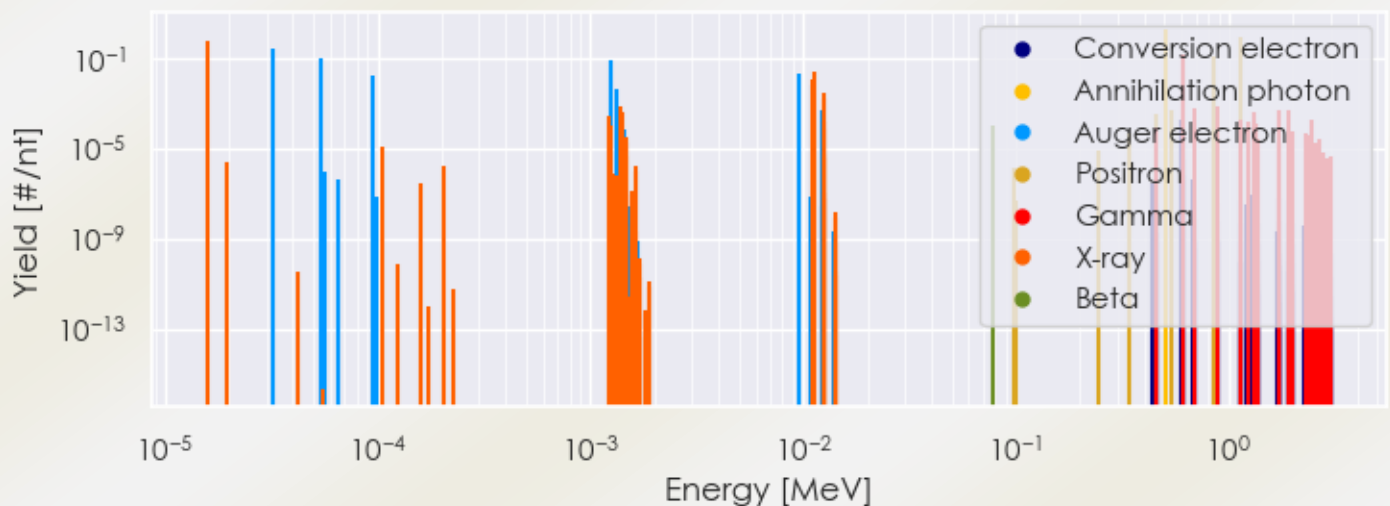
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



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

SUMMARY SPECTRA (PLOT)

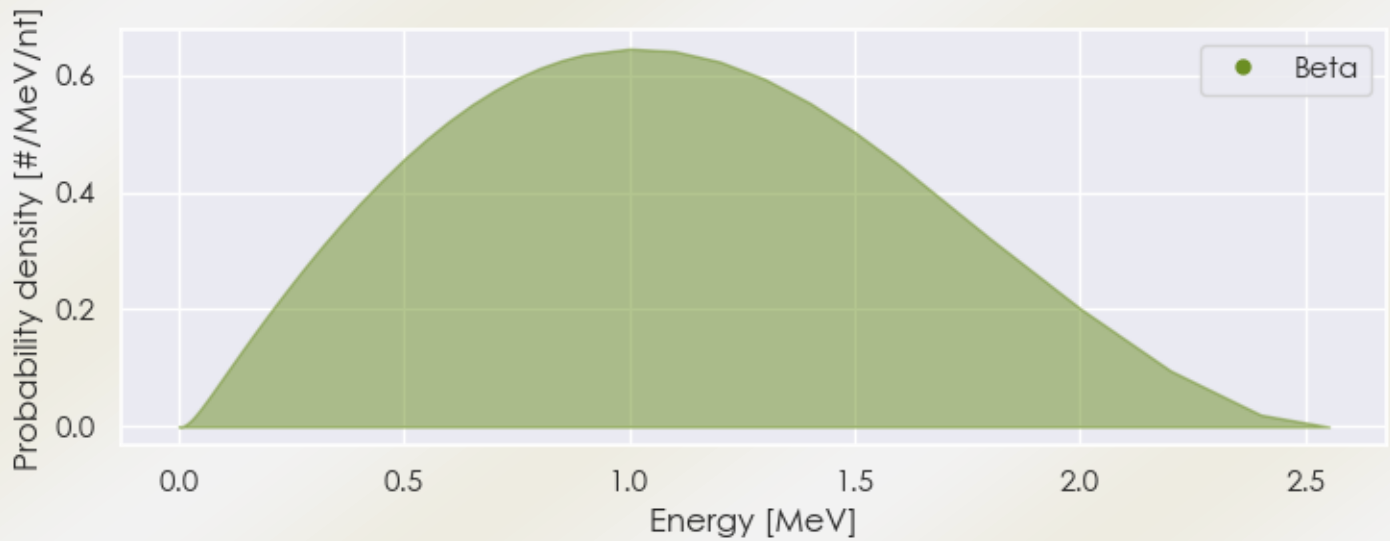
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



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

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.58643e-05	5.709e-01	X-ray
1.11378e-02	1.160e-02	X-ray
1.11804e-02	2.245e-02	X-ray
5.11000e-01	1.849e+00	Annihilation photon
6.13680e-01	1.360e-01	Gamma
8.57197e-01	1.150e-01	Positron
1.14247e+00	8.087e-01	Positron
3.25137e-05	2.636e-01	Auger electron
5.45930e-05	9.751e-02	Auger electron
9.46528e-05	1.710e-02	Auger electron

1.23736e-03	8.404e-02	Auger electron
9.62662e-03	2.090e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6