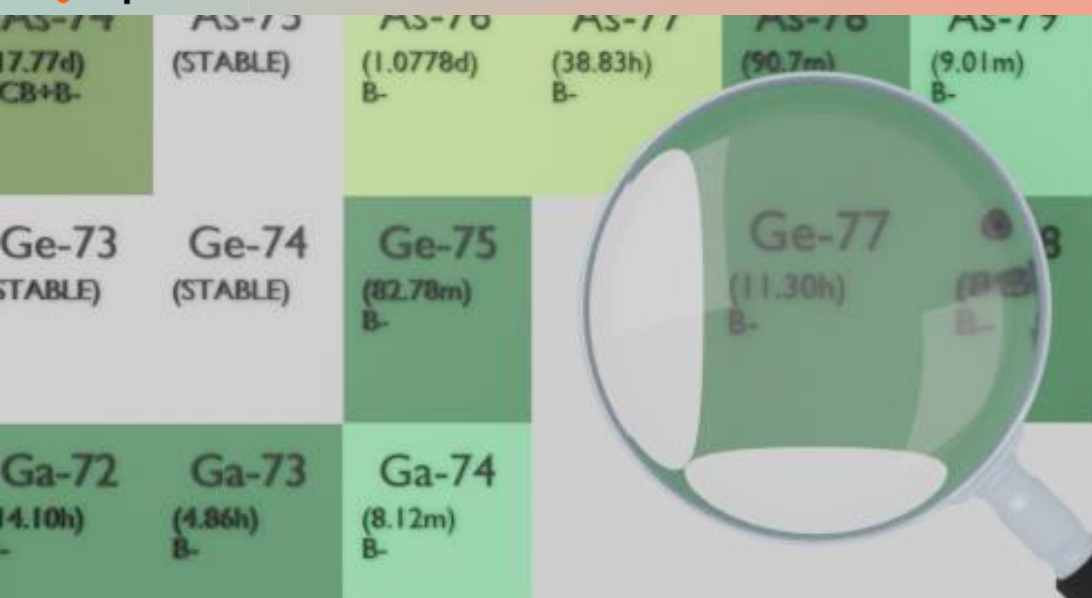




GERMANIUM-77

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ge-77
Atomic number (Z): 32
Mass number (A): 77
Neutron number (N): 45

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 11.3 [h]
Decay constant: 1.7039×10^{-5} [1/s]
Daughters: As-77 (100.0%)
Radioactive daughters: As-77

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.64934 [MeV]
Mean photon energy: 1.07865 [MeV]
Air kerma rate constant, Γ_{10} : 3.939×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.939×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.040×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

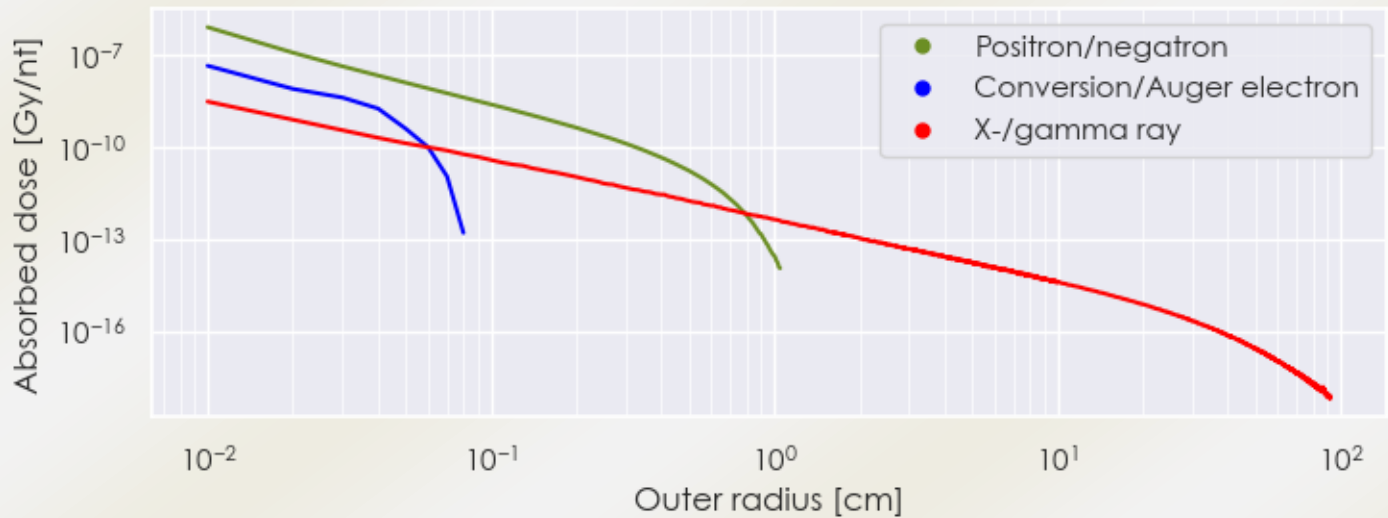
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 1.040e-13 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.728e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

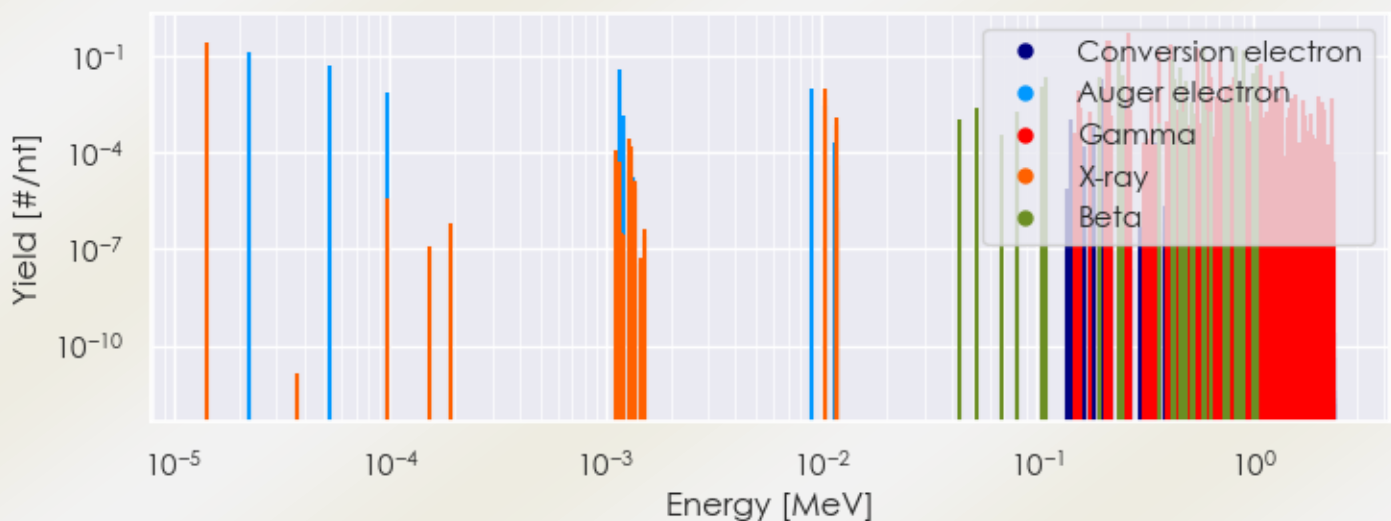
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



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

SUMMARY SPECTRA (PLOT)

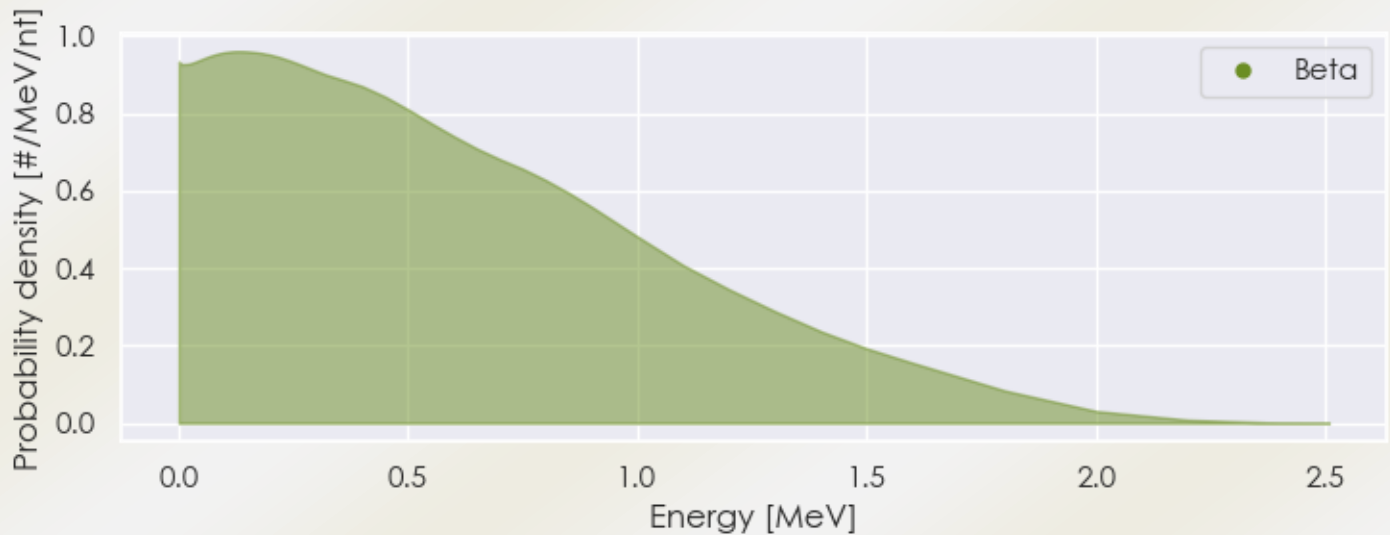
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



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

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.42082e-05	2.704e-01	X-ray
1.94760e-01	1.773e-02	Gamma
2.11030e-01	3.083e-01	Gamma
2.15500e-01	2.862e-01	Gamma
2.64440e-01	5.390e-01	Gamma
3.67400e-01	1.401e-01	Gamma
4.16330e-01	2.183e-01	Gamma
4.19750e-01	1.229e-02	Gamma
4.61380e-01	1.267e-02	Gamma
5.58020e-01	1.606e-01	Gamma

6.31820e-01	6.953e-02	Gamma
6.34390e-01	2.081e-02	Gamma
7.14350e-01	7.169e-02	Gamma
7.81260e-01	1.013e-02	Gamma
7.84770e-01	1.315e-02	Gamma
8.10350e-01	2.269e-02	Gamma
9.28850e-01	1.046e-02	Gamma
1.08519e+00	6.048e-02	Gamma
1.19326e+00	2.566e-02	Gamma
1.36840e+00	3.342e-02	Gamma
1.04705e-01	1.140e-02	Beta
1.08999e-01	2.257e-02	Beta
1.93622e-01	2.197e-02	Beta
2.36905e-01	7.991e-02	Beta
2.48500e-01	2.497e-02	Beta
4.19973e-01	7.112e-02	Beta
4.33978e-01	1.738e-02	Beta
4.36035e-01	1.848e-02	Beta
4.64789e-01	4.505e-02	Beta
4.90752e-01	1.748e-02	Beta
5.83711e-01	1.848e-01	Beta
8.38884e-01	2.048e-01	Beta
9.11722e-01	1.528e-01	Beta
1.01065e+00	2.897e-02	Beta
1.04417e+00	5.294e-02	Beta
2.23272e-05	1.275e-01	Auger electron
5.24635e-05	4.692e-02	Auger electron
1.15640e-03	3.947e-02	Auger electron
9.06608e-03	1.021e-02	Auger electron
1.99201e-01	2.012e-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