



BISMUTH-207

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Bi-207

Atomic number (Z): 83

Mass number (A): 207

Neutron number (N): 124

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture

Half-life: 32.9 [y]

Decay constant: 6.6763×10^{-10} [1/s]

Daughters: Pb-207 (100.0%)

Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]

Mean electron energy: 0.11929 [MeV]

Mean photon energy: 1.53703 [MeV]

Air kerma rate constant, Γ_{10} : 6.934×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]

Air kerma coefficient, K_{air} : 6.935×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]

Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.911×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]

Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

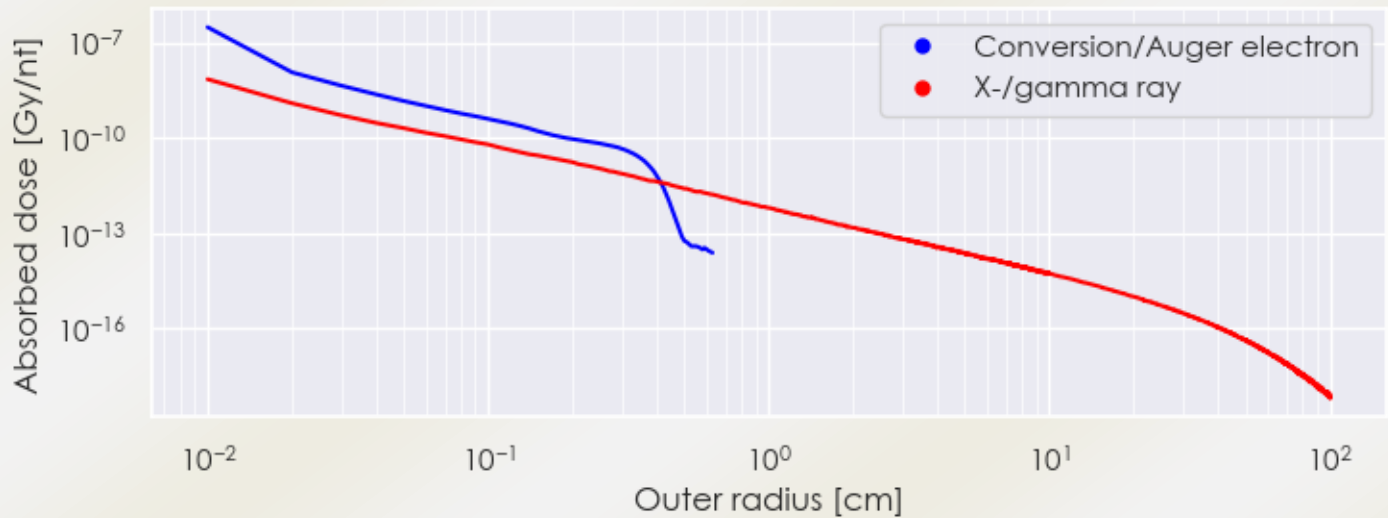
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.911×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.463×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

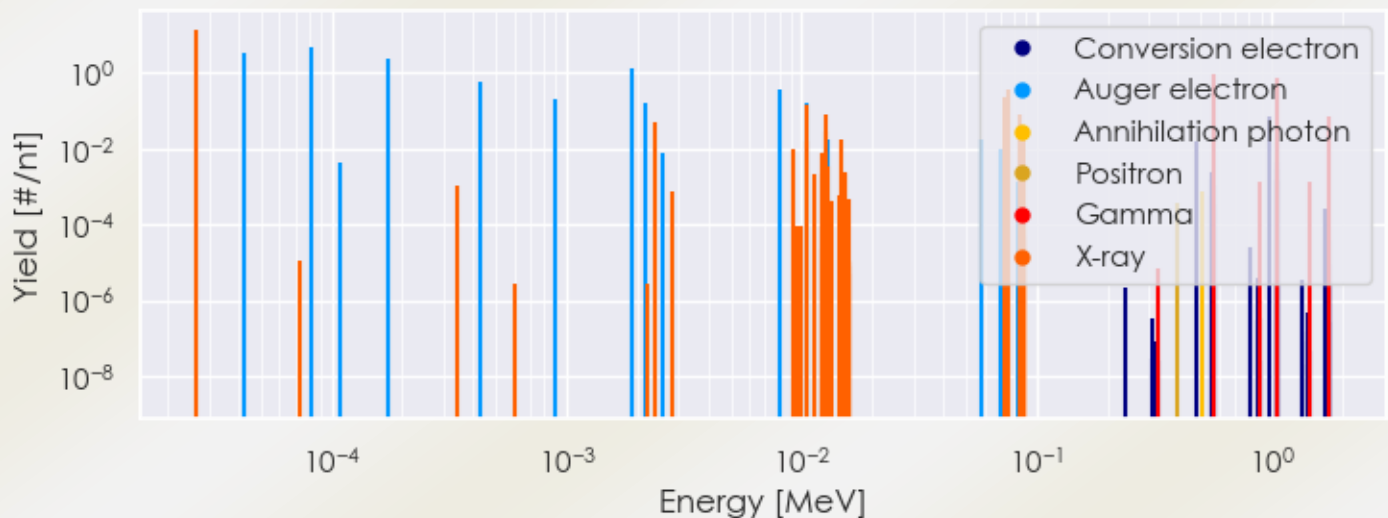
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Bi-207 DPK.csv

SUMMARY SPECTRA (PLOT)

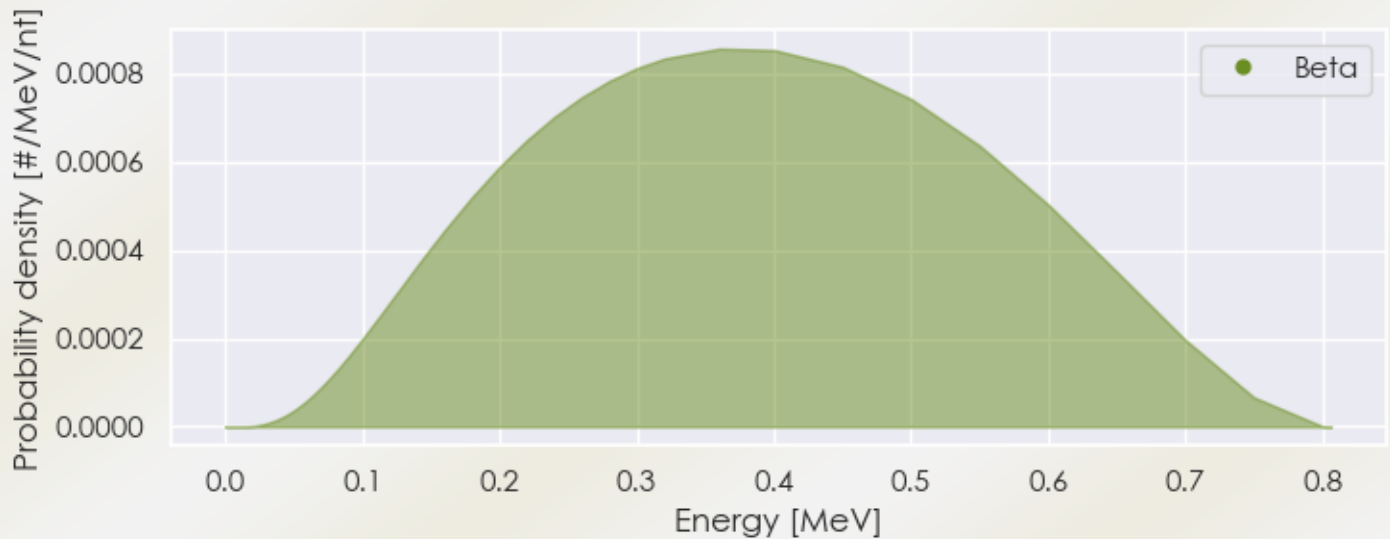
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Bi-207 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/Bi-207 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/Bi-207 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
2.66192e-05	1.412e+01	X-ray
2.37990e-03	5.292e-02	X-ray
1.04453e-02	1.641e-02	X-ray
1.05510e-02	1.444e-01	X-ray
1.26275e-02	2.779e-02	X-ray
1.26563e-02	8.449e-02	X-ray
1.48158e-02	1.725e-02	X-ray
7.30390e-02	2.180e-01	X-ray
7.52501e-02	3.662e-01	X-ray
8.47407e-02	4.079e-02	X-ray

8.52354e-02	7.901e-02	X-ray
8.76558e-02	1.912e-02	X-ray
5.69698e-01	9.776e-01	Gamma
1.06366e+00	7.460e-01	Gamma
1.77023e+00	6.870e-02	Gamma
4.21672e-05	3.180e+00	Auger electron
8.25283e-05	4.568e+00	Auger electron
1.73916e-04	2.409e+00	Auger electron
4.25036e-04	5.511e-01	Auger electron
8.99994e-04	2.134e-01	Auger electron
1.91031e-03	1.278e+00	Auger electron
2.17109e-03	1.593e-01	Auger electron
8.04420e-03	3.651e-01	Auger electron
1.04213e-02	1.615e-01	Auger electron
1.28274e-02	1.712e-02	Auger electron
5.87487e-02	1.847e-02	Auger electron
7.07077e-02	1.010e-02	Auger electron
4.81408e-01	1.562e-02	Conversion electron
9.75366e-01	7.287e-02	Conversion electron
1.04781e+00	1.436e-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/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6