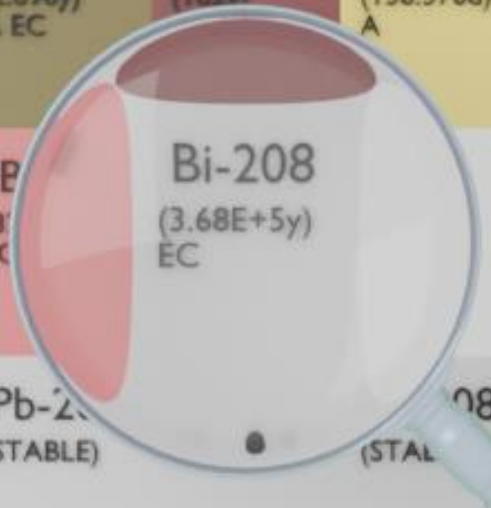




U-235 (4.468e9y) α	U-238 (4.468e9y) α	Th-232 (1.405e10y) α	Pa-233 (27.0d) β	U-235 (4.468e9y) α	U-238 (4.468e9y) α	Th-232 (1.405e10y) α	Pa-233 (27.0d) β	U-235 (4.468e9y) α	U-238 (4.468e9y) α	Th-232 (1.405e10y) α	Pa-233 (27.0d) β
Bi-204 (1.122h) β	Bi-205 (15.31d) ECβ	Bi-206 (6.243d) ECβ	Bi-207 (3.1e10y) ECβ	Bi-208 (3.68E+5y) EC	Bi-209 (1.9e19y) β	Bi-210 (5.013d) β	Bi-211 (2.14m) αβ	Bi-212 (60.55m) β	Bi-213 (45.6m) β	Bi-214 (19.9m) β	Bi-215 (10.0m) β
Pb-203 (51.873h) β	Pb-204 (STABLE)	Pb-205 (1.53E+7y) EC	Pb-206 (STABLE)	Pb-207 (2.14E+4y) β	Pb-208 (STABLE)	Pb-209 (3.253h) β	Pb-210 (22.20y) β	Pb-211 (36.1m) β	Pb-212 (10.64h) β	Pb-213 (4.81m) β	Pb-214 (26.8m) β

BISMUTH-208

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Bi-208
Atomic number (Z): 83
Mass number (A): 208
Neutron number (N): 125

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 368000.0 [y]
Decay constant: 5.9687e-14 [1/s]
Daughters: Pb-208 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.01437 [MeV]
Mean photon energy: 2.646 [MeV]
Air kerma rate constant, Γ_{10} : 8.583e-17 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 8.583e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 2.302e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

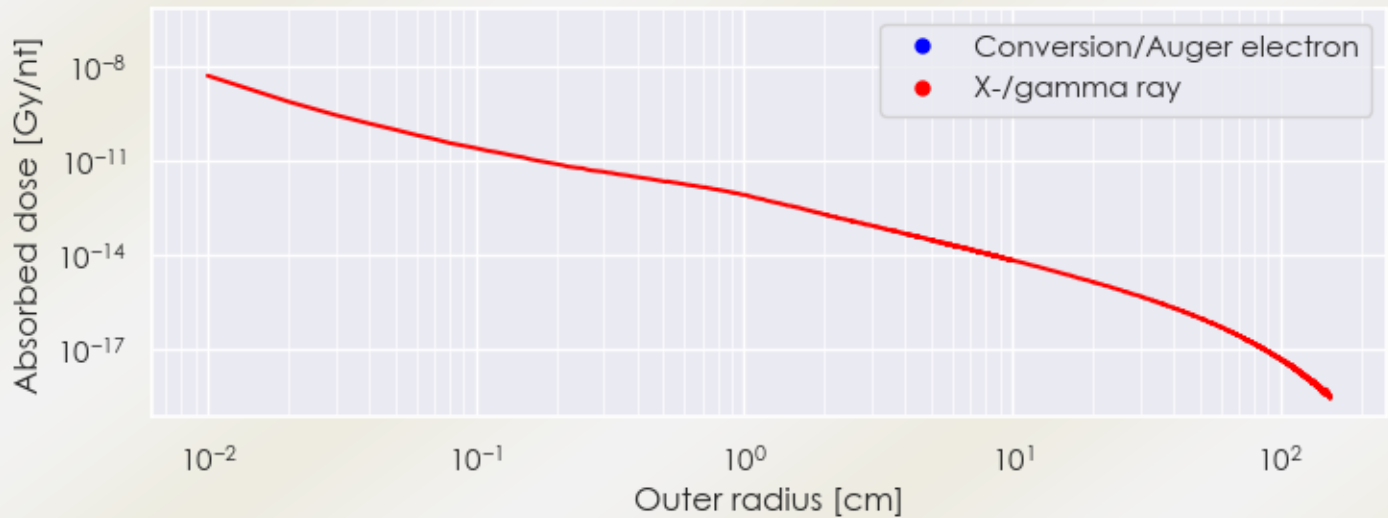
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 2.302×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 4.239×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

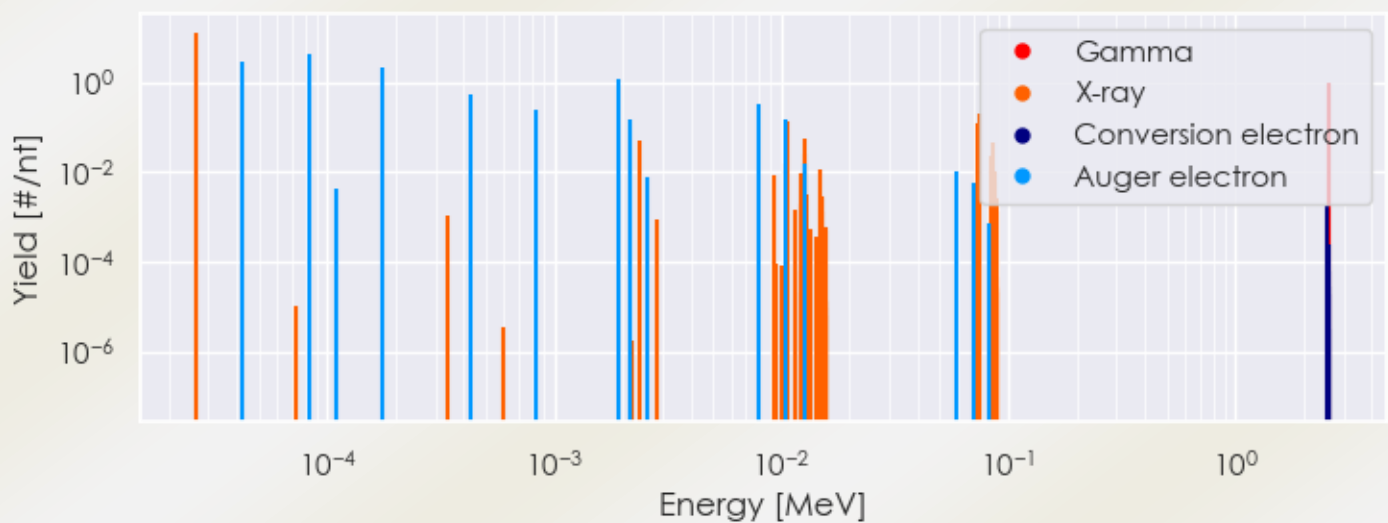
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Bi-208 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-208 Summary 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-208 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Bi-208%20Summary%20Spectrum.csv)

Energy [MeV]	Yield [# / n _t] if > 0.01	Radiation type
2.66148e-05	1.290e+01	X-ray
2.37878e-03	4.810e-02	X-ray
1.04453e-02	1.503e-02	X-ray
1.05510e-02	1.323e-01	X-ray
1.26275e-02	2.547e-02	X-ray
1.26563e-02	5.393e-02	X-ray
1.27924e-02	1.063e-02	X-ray
1.48158e-02	1.101e-02	X-ray
7.30390e-02	1.231e-01	X-ray
7.52501e-02	2.067e-01	X-ray
8.47407e-02	2.302e-02	X-ray
8.52354e-02	4.460e-02	X-ray
8.76558e-02	1.079e-02	X-ray
2.61000e+00	1.000e+00	Gamma
4.21388e-05	2.912e+00	Auger electron
8.26696e-05	4.168e+00	Auger electron
1.73810e-04	2.196e+00	Auger electron
4.24467e-04	5.175e-01	Auger electron
8.37809e-04	2.422e-01	Auger electron
1.90855e-03	1.162e+00	Auger electron
2.16931e-03	1.448e-01	Auger electron
7.98583e-03	3.185e-01	Auger electron
1.03611e-02	1.407e-01	Auger electron
1.27661e-02	1.491e-02	Auger electron
5.87487e-02	1.042e-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