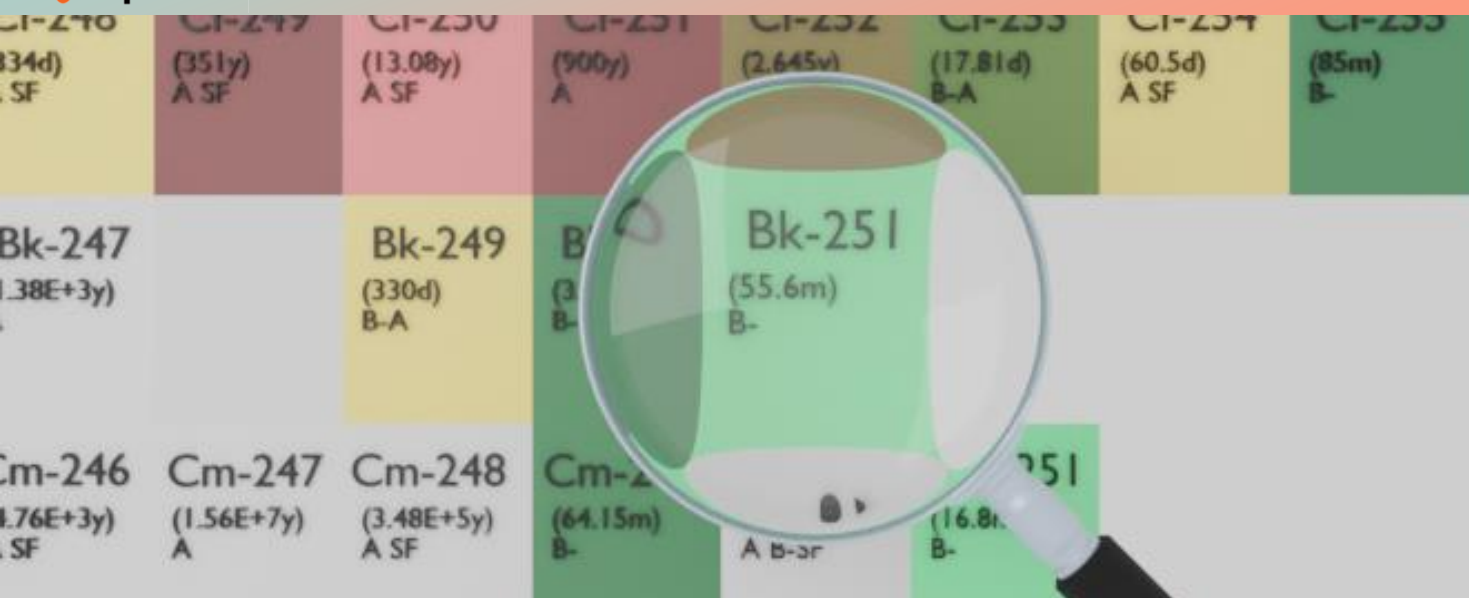




BERKELIUM-251

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Bk-251
Atomic number (Z): 97
Mass number (A): 251
Neutron number (N): 154

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 55.6 [m]
Decay constant: 2.0778×10^{-4} [1/s]
Daughters: Cf-251 (100.0%)
Radioactive daughters: Cf-251

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.36933 [MeV]
Mean photon energy: 0.0915 [MeV]
Air kerma rate constant, Γ_{10} : 1.183×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.183×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 5.917×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

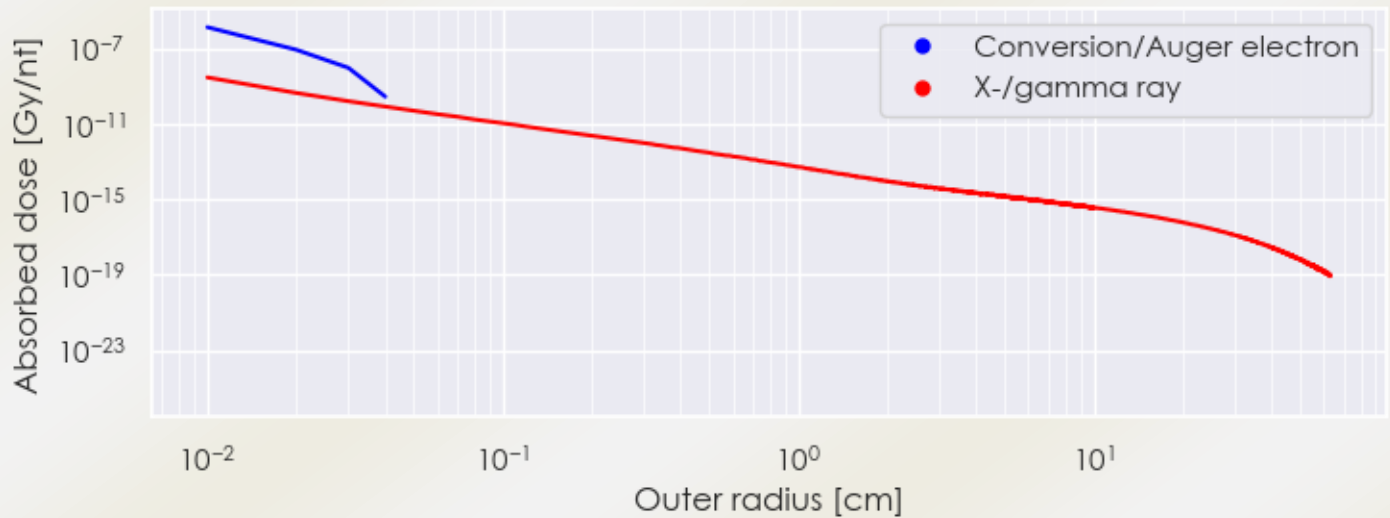
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta+, e^-}$: 5.917×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.466×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

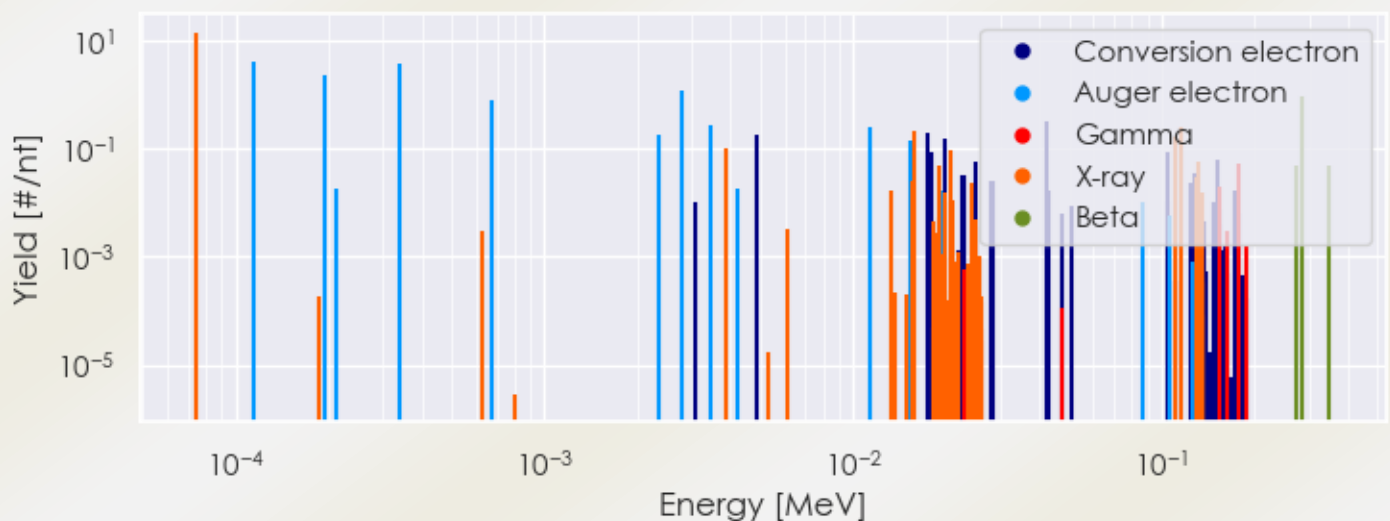
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Bk-251 DPK.csv

SUMMARY SPECTRA (PLOT)

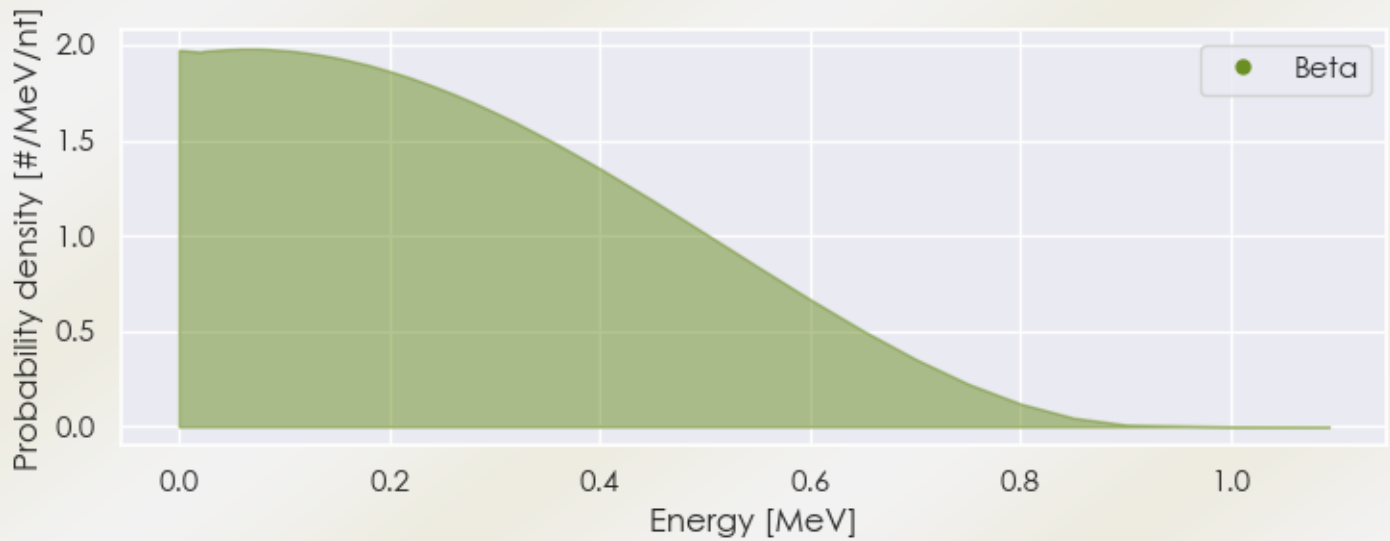
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Bk-251 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/Bk-251 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/Bk-251 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
7.45444e-05	1.430e+01	X-ray
3.86326e-03	1.036e-01	X-ray
1.31965e-02	1.688e-02	X-ray
1.54368e-02	2.515e-02	X-ray
1.56809e-02	2.207e-01	X-ray
1.90028e-02	4.822e-02	X-ray
1.96961e-02	1.501e-02	X-ray
2.07498e-02	9.386e-02	X-ray
2.09431e-02	1.088e-02	X-ray
2.42553e-02	2.243e-02	X-ray

1.10388e-01	1.654e-01	X-ray
1.15701e-01	2.558e-01	X-ray
1.29279e-01	2.995e-02	X-ray
1.30000e-01	3.016e-02	Gamma
1.30526e-01	5.918e-02	X-ray
1.34357e-01	1.585e-02	X-ray
1.53000e-01	2.002e-02	Gamma
1.78000e-01	5.200e-02	Gamma
2.74244e-01	5.000e-02	Beta
2.86298e-01	9.000e-01	Beta
3.50494e-01	5.000e-02	Beta
1.14358e-04	3.903e+00	Auger electron
1.94555e-04	2.295e+00	Auger electron
2.11777e-04	1.794e-02	Auger electron
3.36988e-04	3.781e+00	Auger electron
6.73819e-04	7.839e-01	Auger electron
2.33599e-03	1.824e-01	Auger electron
2.79913e-03	1.165e+00	Auger electron
3.07200e-03	1.024e-02	Conversion electron
3.46683e-03	2.813e-01	Auger electron
4.23011e-03	1.834e-02	Auger electron
4.89500e-03	1.819e-01	Conversion electron
1.13083e-02	2.586e-01	Auger electron
1.52764e-02	1.386e-01	Auger electron
1.73700e-02	1.958e-01	Conversion electron
1.78972e-02	8.318e-02	Conversion electron
1.92769e-02	1.738e-02	Auger electron
1.97202e-02	1.492e-01	Conversion electron
2.25880e-02	3.218e-02	Conversion electron
2.30010e-02	3.108e-02	Conversion electron
2.48240e-02	5.519e-02	Conversion electron
2.79010e-02	2.556e-02	Conversion electron
2.83700e-02	2.504e-02	Conversion electron
4.23700e-02	3.311e-01	Conversion electron
4.27262e-02	1.684e-02	Conversion electron
1.03953e-01	8.742e-02	Conversion electron
1.04758e-01	1.018e-02	Conversion electron
1.24896e-01	2.418e-02	Conversion electron

1.26953e-01	3.632e-02	Conversion electron
1.47896e-01	1.005e-02	Conversion electron
1.51953e-01	6.124e-02	Conversion electron
1.72896e-01	1.694e-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