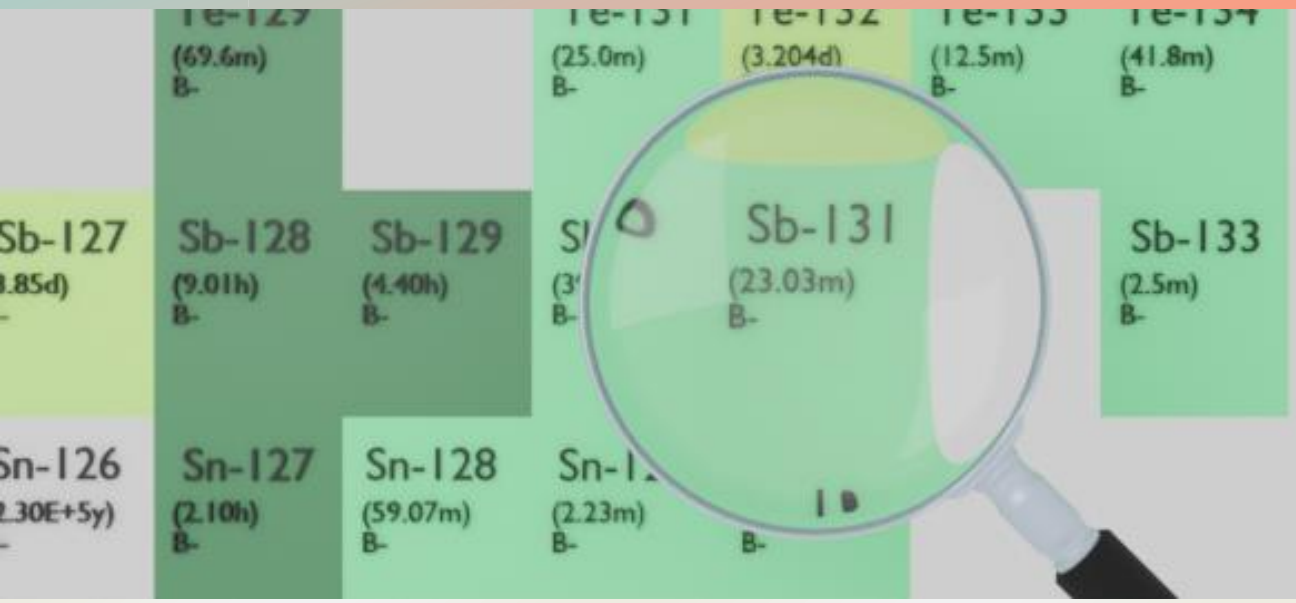


ANTIMONY-131

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Sb-131
Atomic number (Z): 51
Mass number (A): 131
Neutron number (N): 80

RADIOACTIVE DECAY

Decay modes: β-
Half-life: 23.03 [m]
Decay constant: 5.0163e-04 [1/s]
Daughters: Te-131 (91.8%), Te-131m (8.21%)
Radioactive daughters: Te-131, Te-131m

DOSIMETRIC CONSTANTS

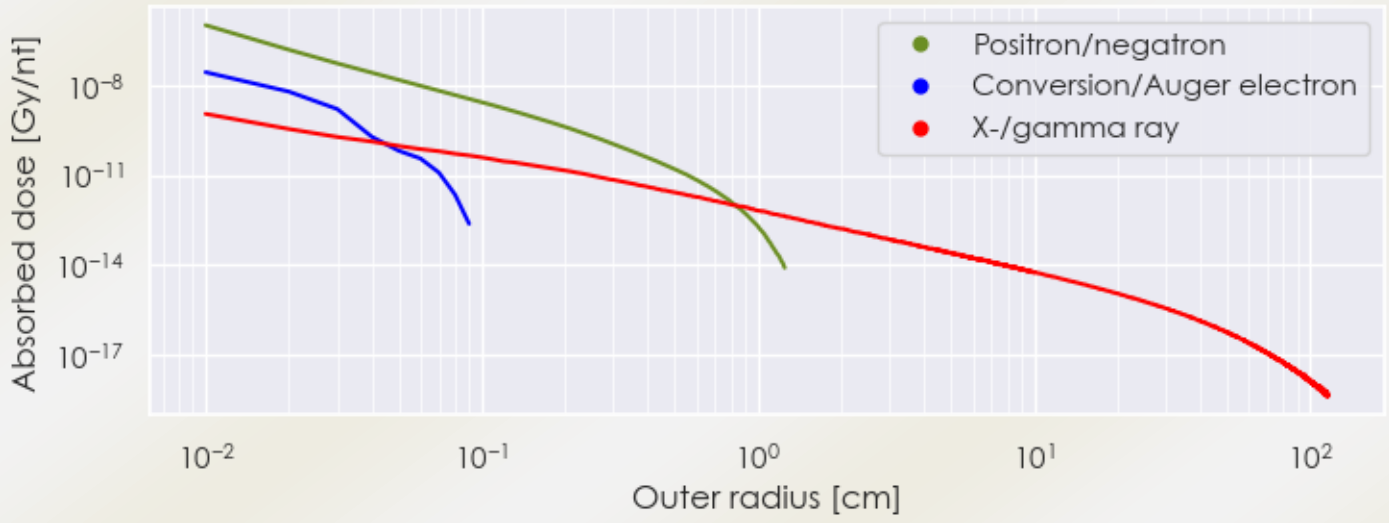
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.58674 [MeV]
Mean photon energy: 2.0733 [MeV]
Air kerma rate constant, Γ_{10}: 7.110e-17 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 7.110e-17 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 9.401e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}: 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 9.401e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 3.322e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

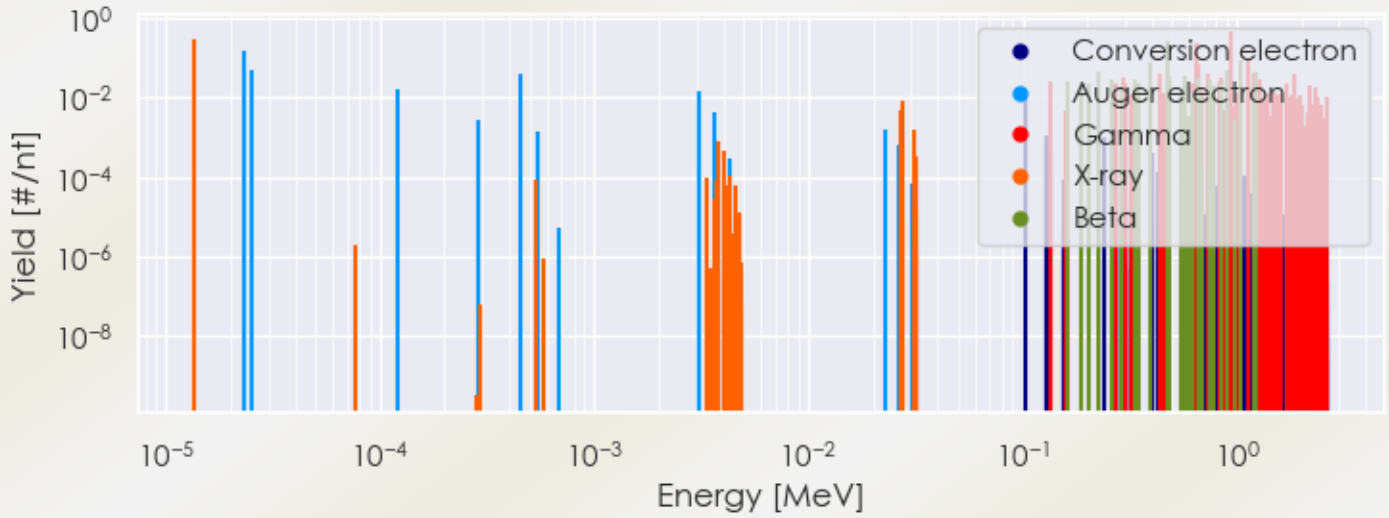
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Sb-131 DPK.csv

SUMMARY SPECTRA (PLOT)

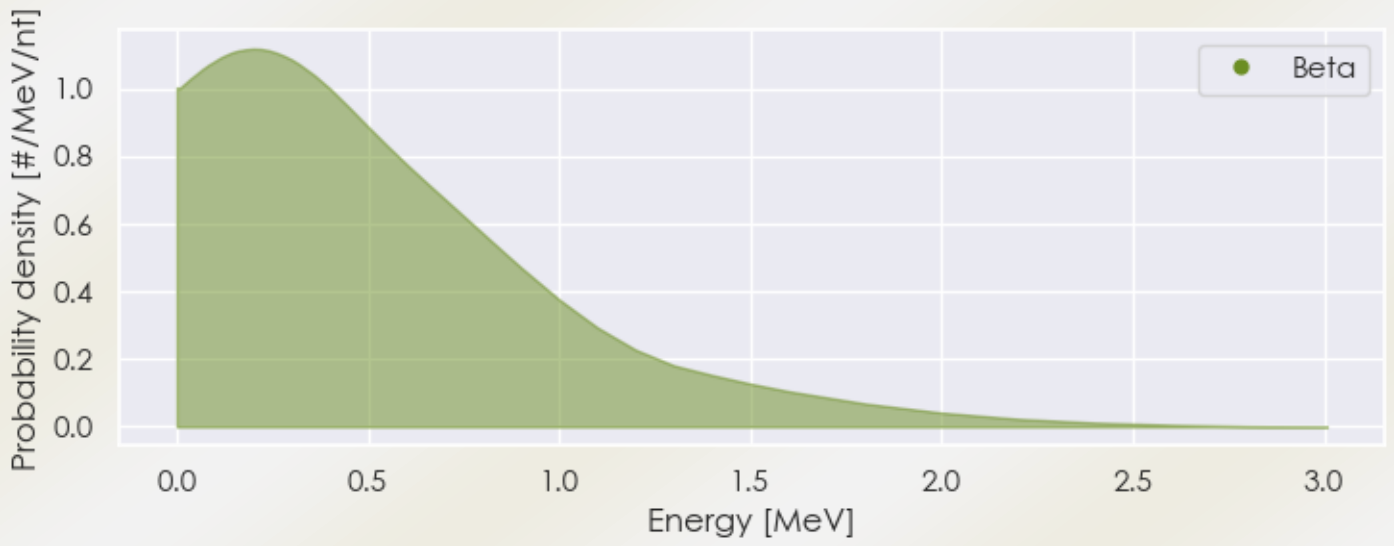
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Sb-131 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/Sb-131 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/Sb-131 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
1.36106e-05	3.008e-01	X-ray
1.34600e-01	2.495e-02	Gamma
2.74200e-01	2.402e-02	Gamma
2.95700e-01	3.188e-02	Gamma
3.01400e-01	2.356e-02	Gamma
3.23800e-01	1.201e-02	Gamma
3.26200e-01	1.201e-02	Gamma
4.33800e-01	3.835e-02	Gamma
4.56700e-01	1.386e-02	Gamma
6.19700e-01	1.571e-02	Gamma

6.25600e-01	2.402e-02	Gamma
6.25600e-01	2.402e-02	Gamma
6.42300e-01	2.310e-01	Gamma
6.57900e-01	7.161e-02	Gamma
6.69000e-01	1.894e-02	Gamma
7.26300e-01	4.019e-02	Gamma
8.24900e-01	2.587e-02	Gamma
8.24900e-01	2.587e-02	Gamma
8.54600e-01	3.234e-02	Gamma
9.33100e-01	2.587e-01	Gamma
9.43400e-01	4.620e-01	Gamma
9.91500e-01	1.386e-02	Gamma
1.12360e+00	9.101e-02	Gamma
1.20740e+00	3.881e-02	Gamma
1.23380e+00	2.264e-02	Gamma
1.26750e+00	2.911e-02	Gamma
1.39890e+00	1.340e-02	Gamma
1.47030e+00	1.428e-02	Gamma
1.51720e+00	1.275e-02	Gamma
1.57350e+00	1.160e-02	Gamma
1.60880e+00	1.386e-02	Gamma
1.72200e+00	2.402e-02	Gamma
1.75610e+00	1.109e-02	Gamma
1.82130e+00	1.201e-02	Gamma
1.85440e+00	4.112e-02	Gamma
1.85440e+00	4.112e-02	Gamma
1.96570e+00	1.160e-02	Gamma
2.17990e+00	2.033e-02	Gamma
2.33500e+00	1.848e-02	Gamma
2.39860e+00	1.109e-02	Gamma
2.66230e+00	1.016e-02	Gamma
1.63466e-01	2.456e-02	Beta
1.86458e-01	2.547e-02	Beta
2.03906e-01	2.183e-02	Beta
2.24900e-01	4.366e-02	Beta
2.62695e-01	2.729e-02	Beta
2.87464e-01	2.001e-02	Beta
3.31462e-01	2.729e-02	Beta

3.50247e-01	2.365e-02	Beta
3.97129e-01	7.823e-02	Beta
4.77739e-01	2.593e-01	Beta
4.87173e-01	3.730e-02	Beta
5.44446e-01	1.455e-02	Beta
5.67306e-01	3.639e-02	Beta
6.22223e-01	1.274e-02	Beta
6.55234e-01	1.546e-02	Beta
6.56638e-01	3.184e-02	Beta
6.89514e-01	1.219e-02	Beta
7.45962e-01	3.002e-02	Beta
7.73051e-01	2.001e-02	Beta
8.41833e-01	1.455e-02	Beta
8.50428e-01	2.183e-02	Beta
8.92982e-01	5.185e-02	Beta
1.03115e+00	9.097e-02	Beta
1.23364e+00	4.457e-02	Beta
2.29189e-05	1.470e-01	Auger electron
2.49468e-05	4.886e-02	Auger electron
1.21476e-04	1.680e-02	Auger electron
4.49180e-04	3.813e-02	Auger electron
3.08071e-03	1.497e-02	Auger electron
1.02795e-01	1.121e-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