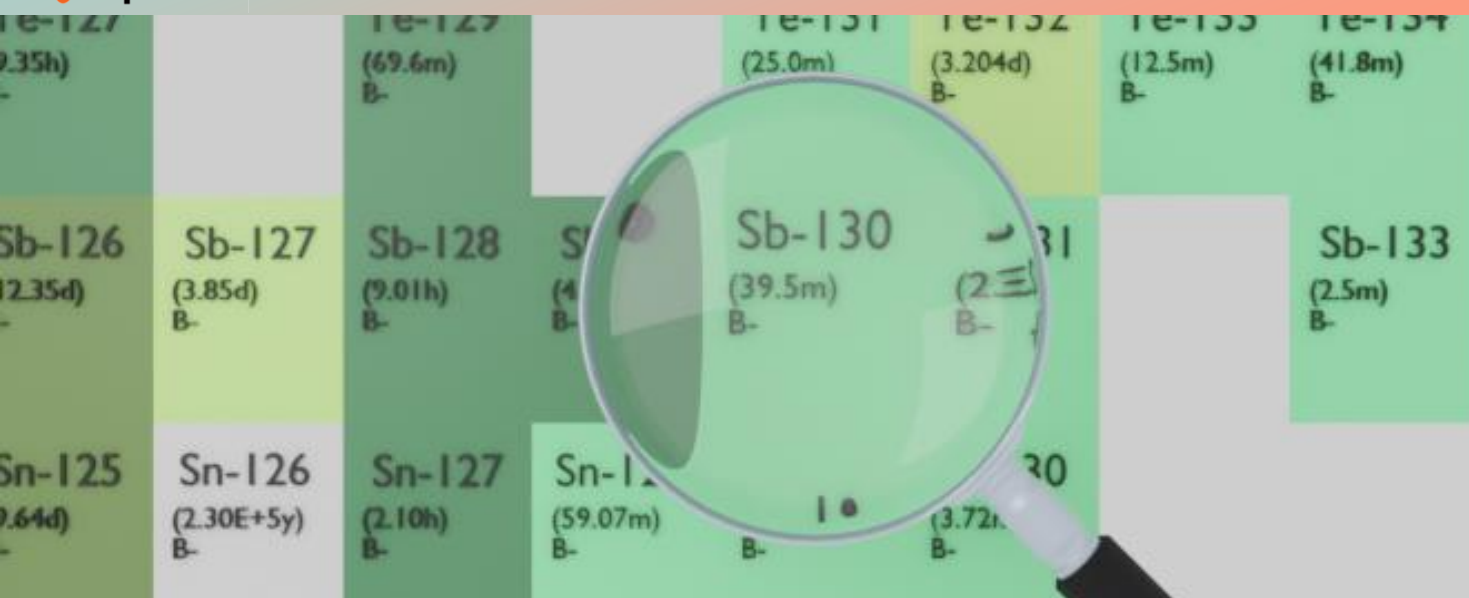




ANTIMONY-130

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Sb-130
Atomic number (Z): 51
Mass number (A): 130
Neutron number (N): 79

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 39.5 [m]
Decay constant: 2.9247×10^{-4} [1/s]
Daughters: Te-130 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.75788 [MeV]
Mean photon energy: 3.27238 [MeV]
Air kerma rate constant, Γ_{10} : 1.186×10^{-16} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.186×10^{-16} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.214×10^{-13} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

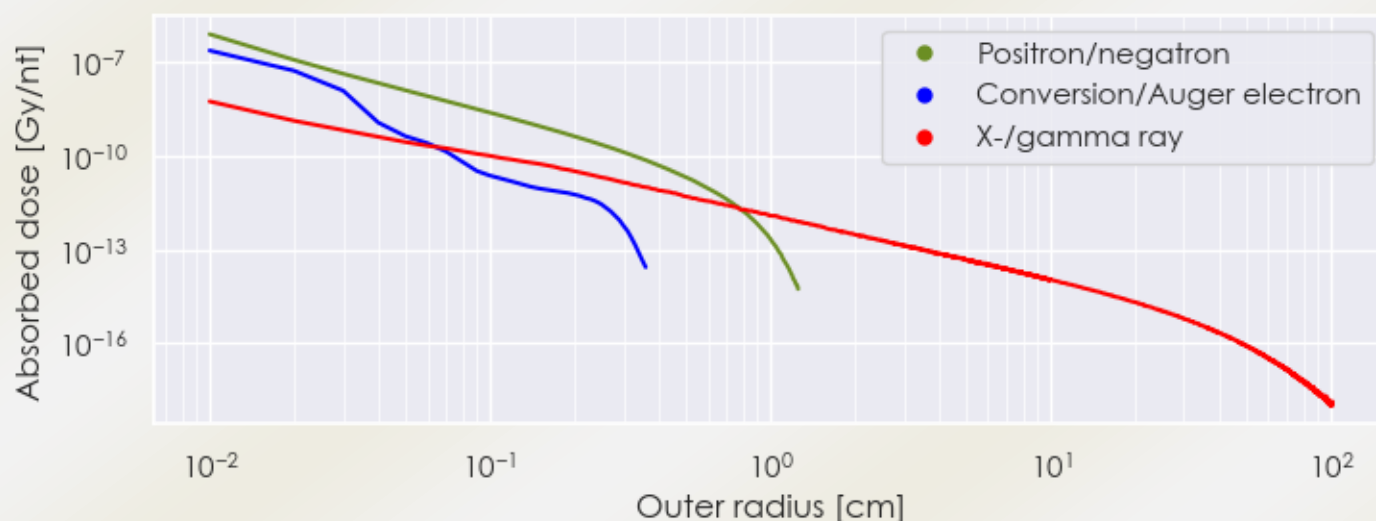
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 1.214×10^{-13} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.243×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

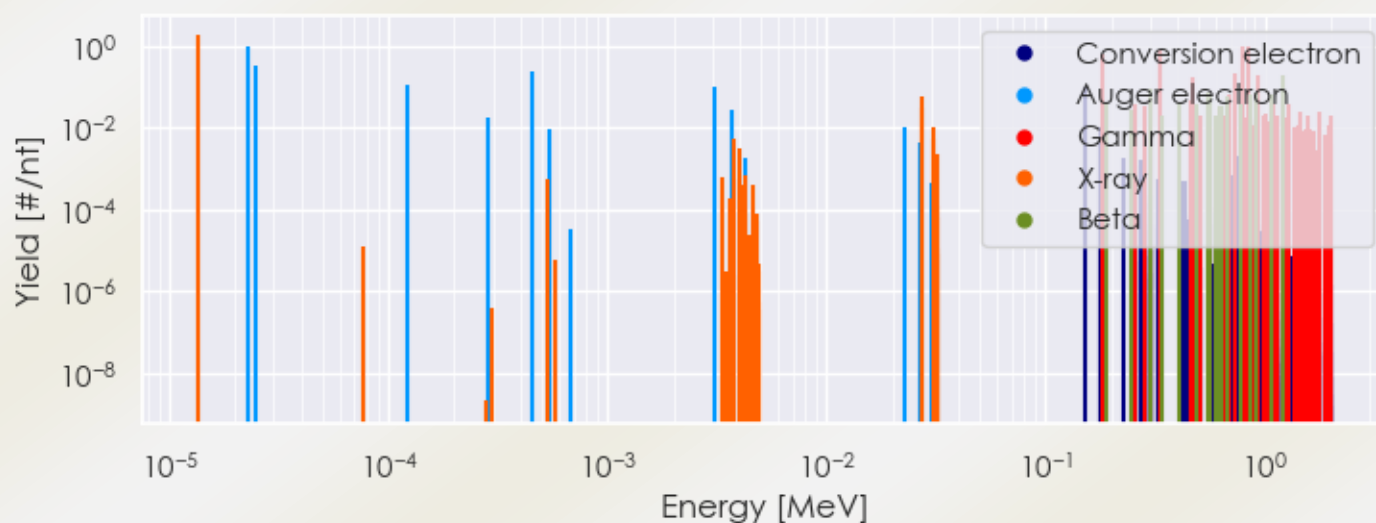
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Sb-130 DPK.csv

SUMMARY SPECTRA (PLOT)

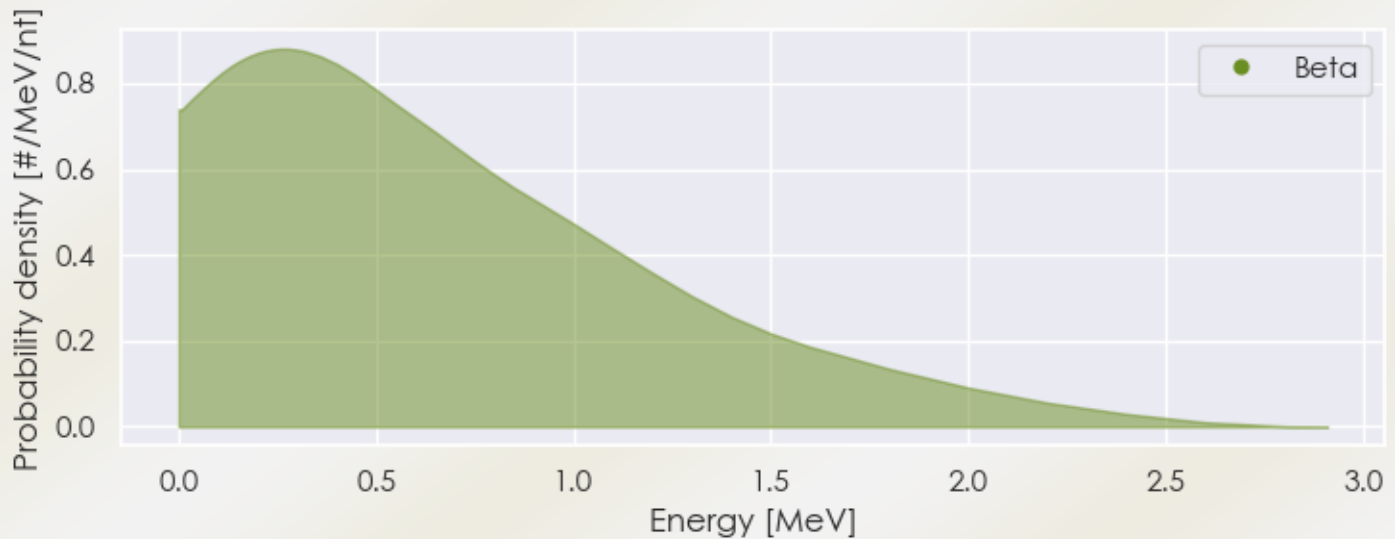
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Sb-130 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-130 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-130 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.36106e-05	1.956e+00	X-ray
2.71868e-02	3.127e-02	X-ray
2.74652e-02	5.821e-02	X-ray
3.09901e-02	1.039e-02	X-ray
1.82330e-01	6.500e-01	Gamma
2.58000e-01	3.900e-02	Gamma
2.85480e-01	3.500e-02	Gamma
3.03300e-01	5.800e-02	Gamma
3.30914e-01	7.800e-01	Gamma
4.55400e-01	4.800e-02	Gamma

4.68000e-01	1.800e-01	Gamma
4.83600e-01	2.200e-02	Gamma
5.06700e-01	2.000e-02	Gamma
5.95500e-01	1.000e-02	Gamma
6.26700e-01	2.800e-02	Gamma
6.35700e-01	1.600e-02	Gamma
6.54700e-01	2.000e-02	Gamma
6.58200e-01	1.700e-02	Gamma
6.69200e-01	1.100e-02	Gamma
6.80900e-01	6.500e-02	Gamma
6.86600e-01	3.200e-02	Gamma
7.32000e-01	2.200e-01	Gamma
7.93400e-01	1.000e+00	Gamma
8.29800e-01	1.800e-02	Gamma
8.39520e-01	1.000e+00	Gamma
8.55700e-01	1.600e-02	Gamma
8.83300e-01	1.200e-02	Gamma
9.14900e-01	1.800e-02	Gamma
9.34900e-01	1.900e-01	Gamma
9.92100e-01	1.900e-02	Gamma
1.00020e+00	2.300e-02	Gamma
1.03070e+00	1.500e-02	Gamma
1.08950e+00	3.700e-02	Gamma
1.14140e+00	2.000e-02	Gamma
1.23900e+00	1.800e-02	Gamma
1.25850e+00	1.000e-02	Gamma
1.29230e+00	3.700e-02	Gamma
1.36870e+00	1.100e-02	Gamma
1.41930e+00	1.200e-02	Gamma
1.44370e+00	2.500e-02	Gamma
1.58190e+00	1.900e-02	Gamma
1.76260e+00	2.500e-02	Gamma
1.94800e+00	1.200e-02	Gamma
1.99740e+00	2.100e-02	Gamma
1.87896e-01	4.266e-02	Beta
2.47148e-01	2.810e-02	Beta
2.99501e-01	8.949e-02	Beta
3.38760e-01	1.977e-02	Beta

4.06769e-01	4.162e-02	Beta
4.92120e-01	3.954e-02	Beta
5.54050e-01	7.596e-02	Beta
5.66511e-01	6.764e-02	Beta
5.95671e-01	1.977e-02	Beta
6.24565e-01	3.434e-02	Beta
6.33239e-01	3.538e-02	Beta
6.76525e-01	5.619e-02	Beta
7.69125e-01	3.746e-02	Beta
8.61142e-01	6.452e-02	Beta
9.05080e-01	7.180e-02	Beta
1.06612e+00	1.665e-02	Beta
1.07111e+00	6.660e-02	Beta
1.19846e+00	1.873e-01	Beta
2.29189e-05	9.559e-01	Auger electron
2.49468e-05	3.177e-01	Auger electron
1.21476e-04	1.092e-01	Auger electron
2.84418e-04	1.843e-02	Auger electron
4.49179e-04	2.479e-01	Auger electron
3.08077e-03	9.733e-02	Auger electron
3.67408e-03	2.755e-02	Auger electron
2.26653e-02	1.011e-02	Auger electron
1.50525e-01	1.066e-01	Conversion electron
1.77416e-01	1.073e-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