ANTIMONY-120

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Sb-120
Atomic number (Z): 51
Mass number (A): 120
Neutron number (N): 69

RADIOACTIVE DECAY

Decay modes: β+, Electron capture
Half-life: 15.89 [m]
Decay constant: 7.2703e-04 [1/s]
Daughters: Sn-120 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

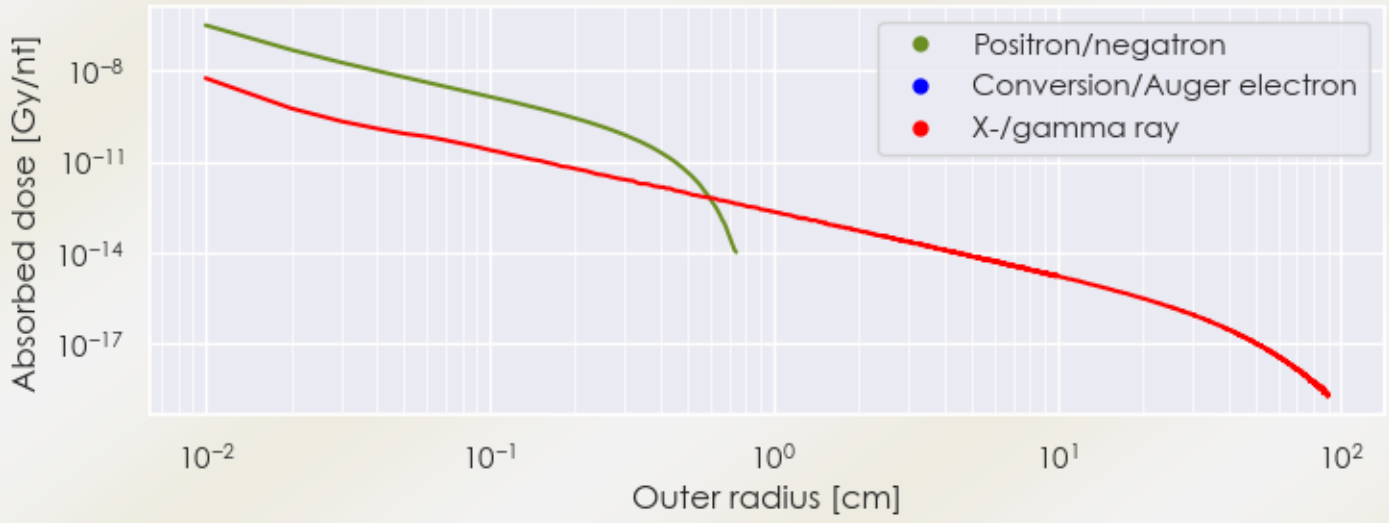
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.30771 [MeV]
Mean photon energy: 0.45213 [MeV]
Air kerma rate constant, Γ_{10}: 4.275e-18 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 2.015e-17 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 4.930e-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, $\Delta_{\beta-,\beta+,e-}$: 4.930e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 7.244e-14 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

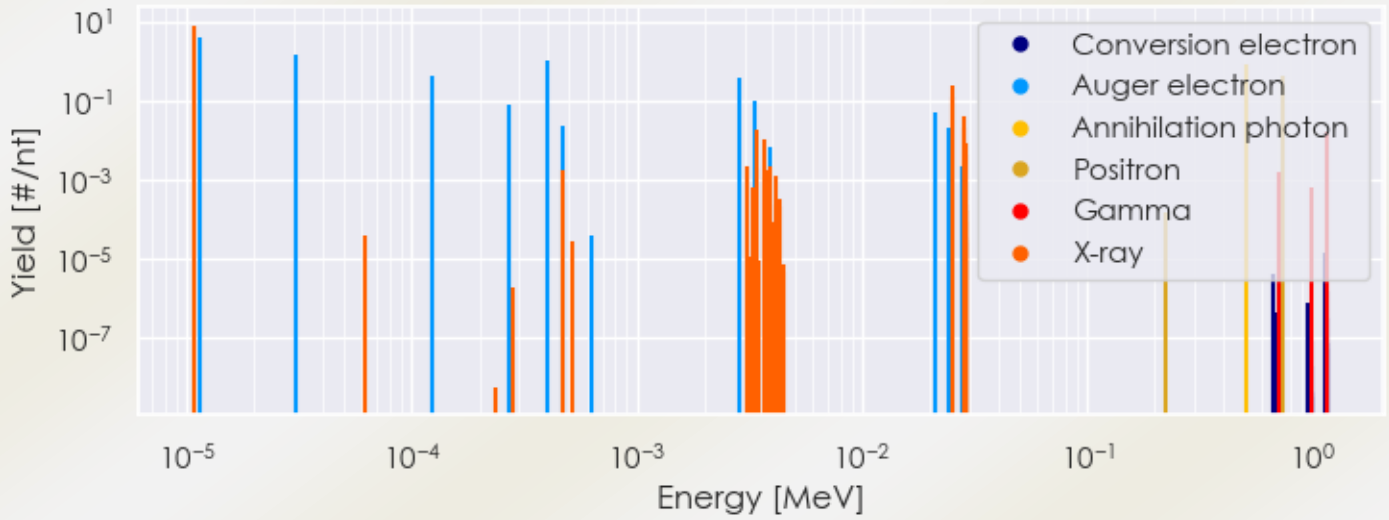
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Sb-120 DPK.csv

SUMMARY SPECTRA (PLOT)

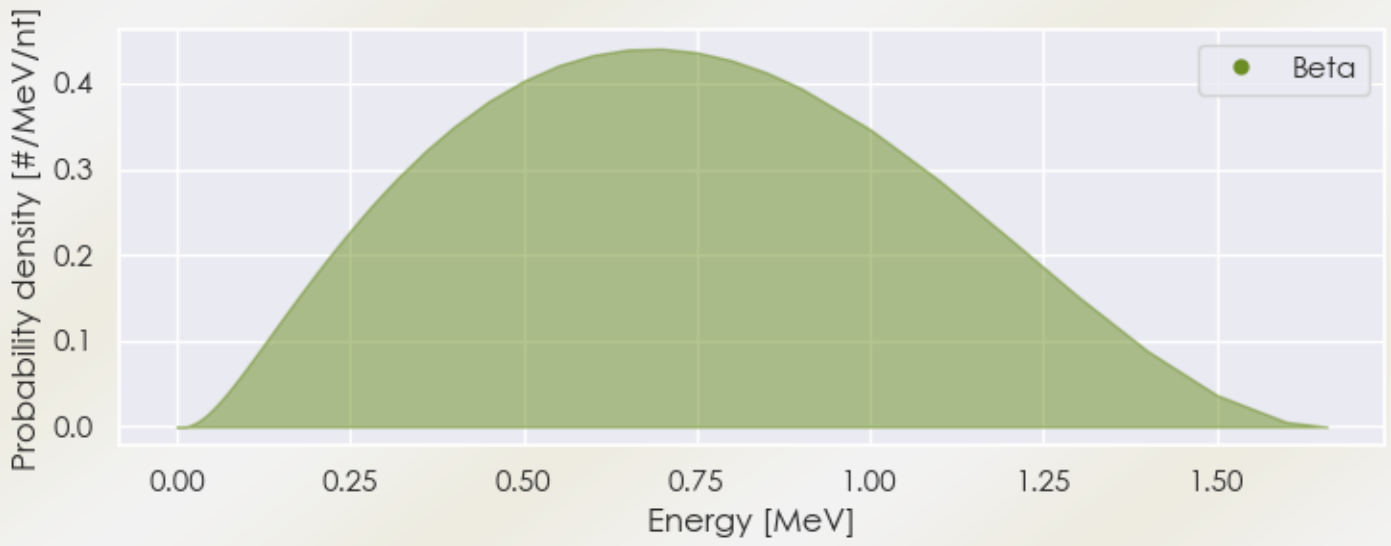
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Sb-120 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-120 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-120 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
1.08543e-05	8.062e+00	X-ray
3.43219e-03	1.786e-02	X-ray
3.65722e-03	1.015e-02	X-ray
2.50232e-02	1.258e-01	X-ray
2.52572e-02	2.354e-01	X-ray
2.84307e-02	2.123e-02	X-ray
2.84736e-02	4.123e-02	X-ray
5.11000e-01	8.203e-01	Annihilation photon
1.17120e+00	1.690e-02	Gamma
7.41589e-01	4.100e-01	Positron

1.13311e-05	3.986e+00	Auger electron
3.03624e-05	1.372e+00	Auger electron
1.23880e-04	4.429e-01	Auger electron
2.72359e-04	7.900e-02	Auger electron
3.96295e-04	9.978e-01	Auger electron
4.70176e-04	2.274e-02	Auger electron
2.84846e-03	3.938e-01	Auger electron
3.36533e-03	1.015e-01	Auger electron
2.09334e-02	4.743e-02	Auger electron
2.44171e-02	2.020e-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/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6