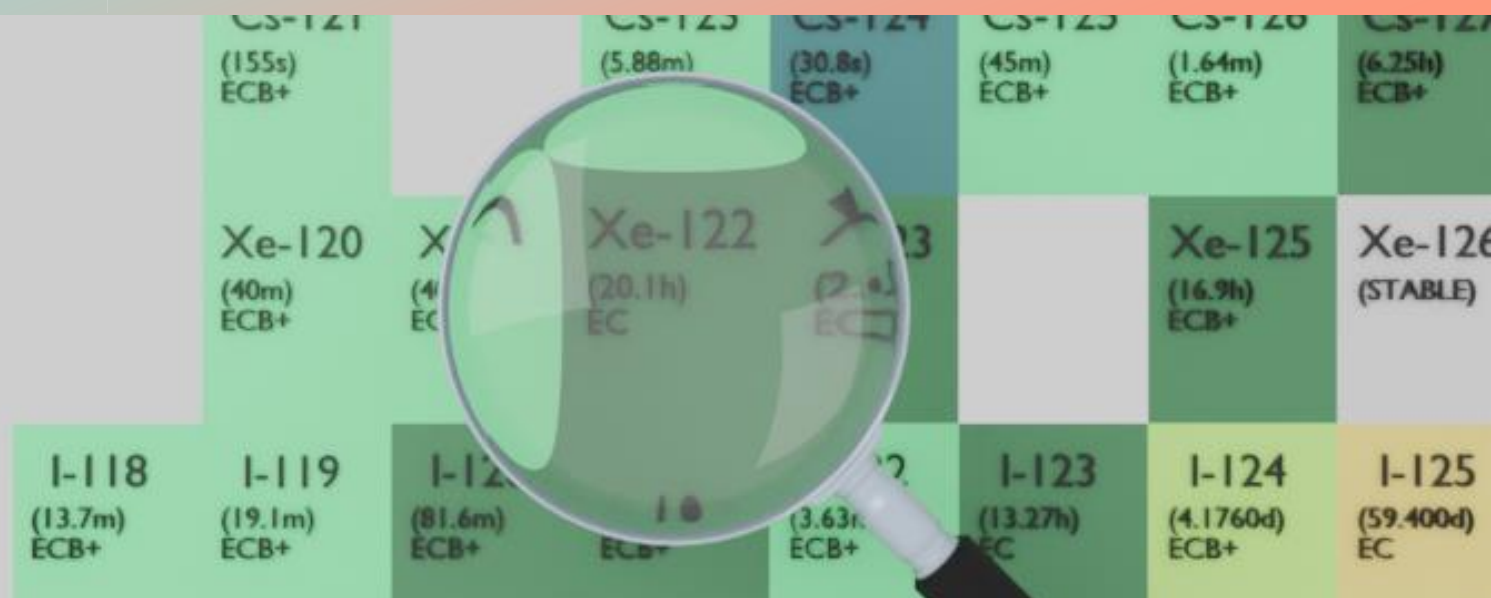




XENON-122

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Xe-122
Atomic number (Z): 54
Mass number (A): 122
Neutron number (N): 68

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 20.1 [h]
Decay constant: 9.5791×10^{-6} [1/s]
Daughters: I-122 (100.0%)
Radioactive daughters: I-122

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.01 [MeV]
Mean photon energy: 0.06839 [MeV]
Air kerma rate constant, Γ_{10} : 6.532×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 6.532×10^{-18} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.602×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

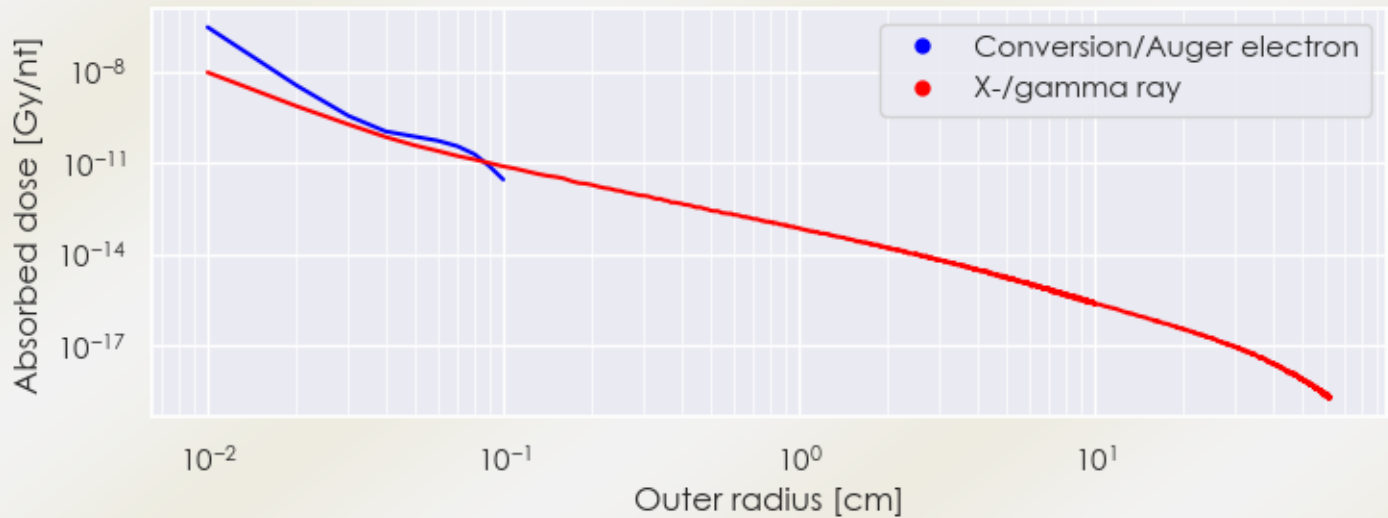
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 1.602×10^{-15} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.096×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

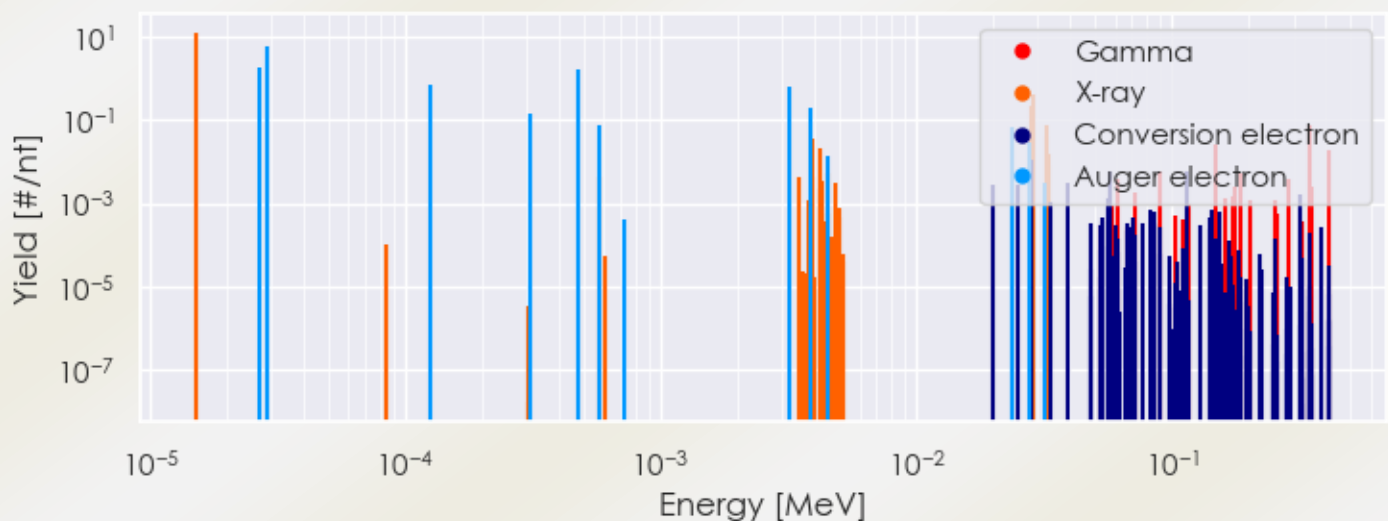
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Xe-122 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/Xe-122 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/Xe-122 Summary Spectrum.csv

Energy [MeV]	Yield [# /nt] if > 0.01	Radiation type
1.52654e-05	1.286e+01	X-ray
3.92520e-03	3.726e-02	X-ray
4.21605e-03	2.157e-02	X-ray
2.83065e-02	2.246e-01	X-ray
2.86096e-02	4.170e-01	X-ray
3.22368e-02	3.878e-02	X-ray
3.22942e-02	7.521e-02	X-ray
3.30298e-02	1.582e-02	X-ray
1.48612e-01	2.621e-02	Gamma
3.50065e-01	7.800e-02	Gamma
4.16633e-01	1.872e-02	Gamma
2.70442e-05	1.931e+00	Auger electron
2.89556e-05	6.195e+00	Auger electron
1.25012e-04	7.128e-01	Auger electron
3.09957e-04	1.421e-01	Auger electron
4.77122e-04	1.645e+00	Auger electron
5.78924e-04	7.835e-02	Auger electron
3.20701e-03	6.450e-01	Auger electron
3.84204e-03	1.906e-01	Auger electron
4.50089e-03	1.389e-02	Auger electron
2.35598e-02	6.744e-02	Auger electron
2.75866e-02	3.019e-02	Auger electron
2.84620e-02	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