



RADIUM-230

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ra-230
Atomic number (Z): 88
Mass number (A): 230
Neutron number (N): 142

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 93.0 [m]
Decay constant: $1.2422\text{e-}04$ [1/s]
Daughters: Ac-230 (100.0%)
Radioactive daughters: Ac-230

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.22006 [MeV]
Mean photon energy: 0.07944 [MeV]
Air kerma rate constant, Γ_{10} : $6.494\text{e-}18$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : $6.494\text{e-}18$ [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : $3.526\text{e-}14$ [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

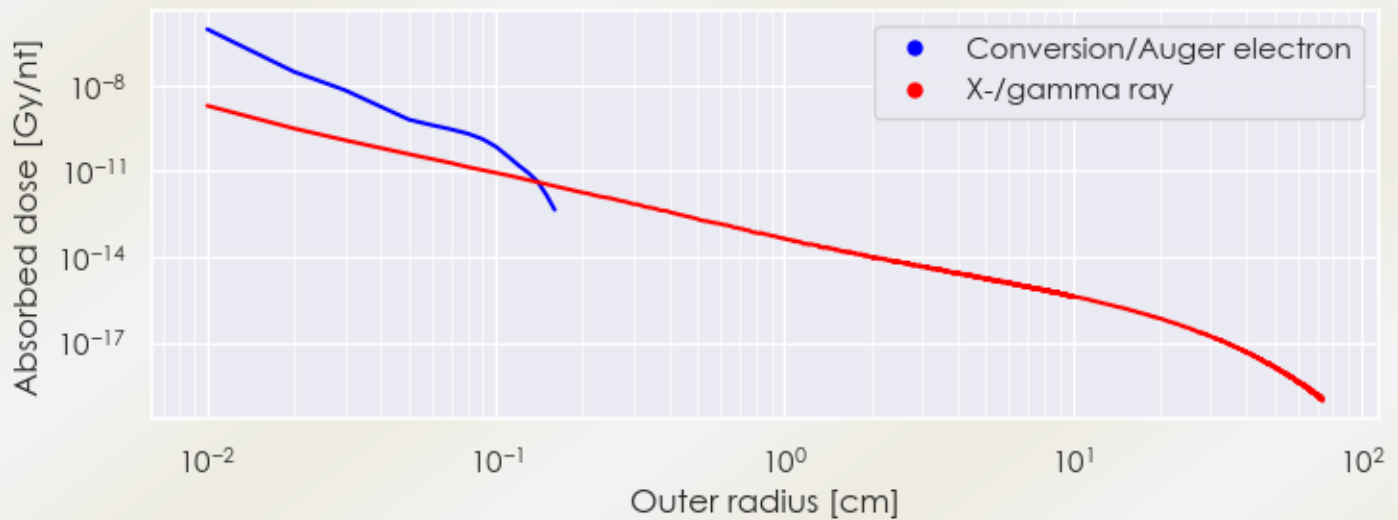
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 3.526×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.273×10^{-14} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

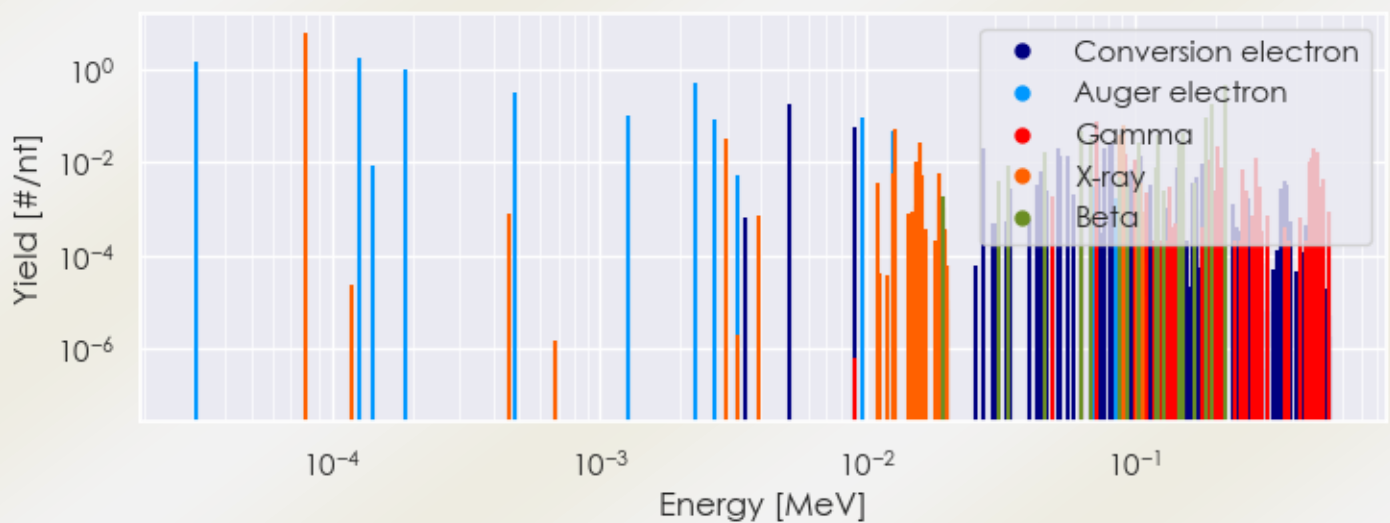
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ra-230 DPK.csv

SUMMARY SPECTRA (PLOT)

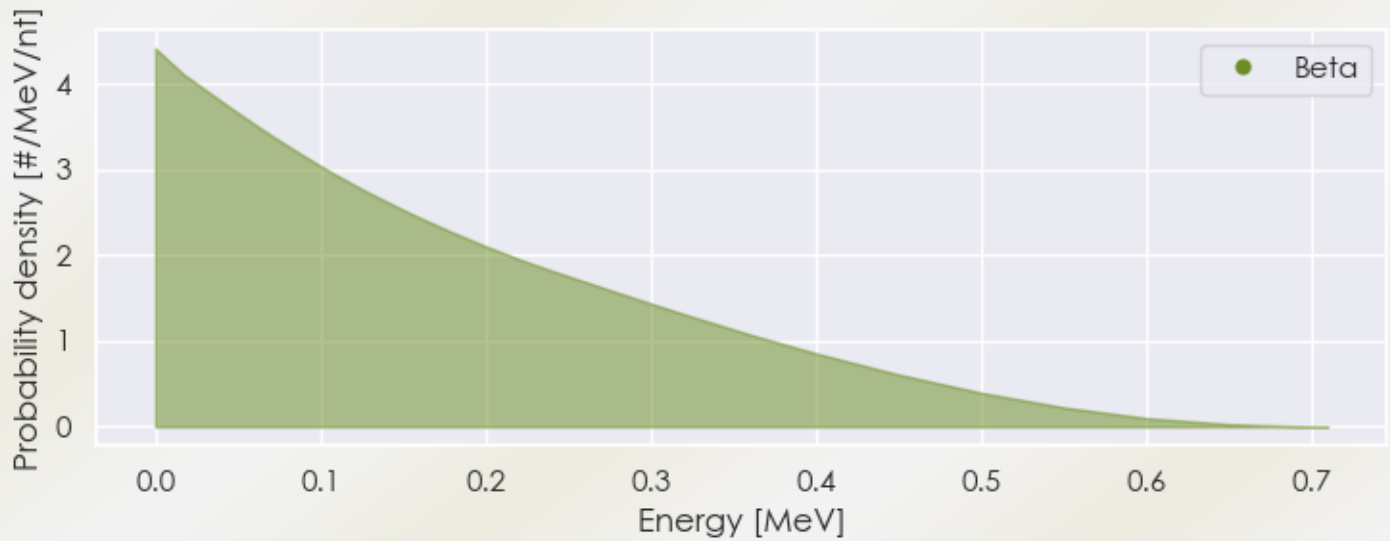
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ra-230 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/Ra-230 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/Ra-230 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
7.95431e-05	6.294e+00	X-ray
2.98480e-03	3.126e-02	X-ray
1.26589e-02	5.200e-02	X-ray
1.52434e-02	1.065e-02	X-ray
1.57834e-02	2.776e-02	X-ray
6.30000e-02	2.800e-02	Gamma
7.20000e-02	7.910e-02	Gamma
8.80271e-02	3.946e-02	X-ray
9.13071e-02	6.412e-02	X-ray
9.21000e-02	1.470e-02	Gamma

1.01000e-01	1.120e-02	Gamma
1.03286e-01	1.427e-02	X-ray
1.89200e-01	1.169e-02	Gamma
2.02800e-01	2.156e-02	Gamma
2.85200e-01	1.274e-02	Gamma
4.48900e-01	1.050e-02	Gamma
4.57900e-01	1.295e-02	Gamma
4.69700e-01	2.051e-02	Gamma
4.78700e-01	1.694e-02	Gamma
4.62476e-02	1.688e-02	Beta
6.29812e-02	4.568e-02	Beta
6.91104e-02	3.178e-02	Beta
1.03177e-01	2.781e-02	Beta
1.22449e-01	4.072e-02	Beta
1.46309e-01	2.384e-02	Beta
1.50803e-01	4.171e-02	Beta
1.83454e-01	8.938e-02	Beta
1.93416e-01	1.788e-01	Beta
2.18449e-01	4.668e-01	Beta
3.11774e-05	1.446e+00	Auger electron
1.26700e-04	1.692e+00	Auger electron
1.87316e-04	9.582e-01	Auger electron
4.82933e-04	3.128e-01	Auger electron
1.27713e-03	1.009e-01	Auger electron
2.28677e-03	5.192e-01	Auger electron
2.69613e-03	8.788e-02	Auger electron
5.09610e-03	1.726e-01	Conversion electron
9.00000e-03	5.837e-02	Conversion electron
9.54458e-03	9.579e-02	Auger electron
1.25749e-02	4.704e-02	Auger electron
2.71100e-02	2.001e-02	Conversion electron
5.21520e-02	2.024e-02	Conversion electron
5.28370e-02	1.382e-02	Conversion electron
5.61170e-02	1.374e-02	Conversion electron
6.80961e-02	1.169e-02	Conversion electron
7.22520e-02	4.660e-02	Conversion electron
7.69100e-02	2.093e-02	Conversion electron
8.11520e-02	2.721e-02	Conversion electron

8.20100e-02	2.814e-02	Conversion electron
8.81961e-02	1.246e-02	Conversion electron
1.04610e-01	1.389e-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