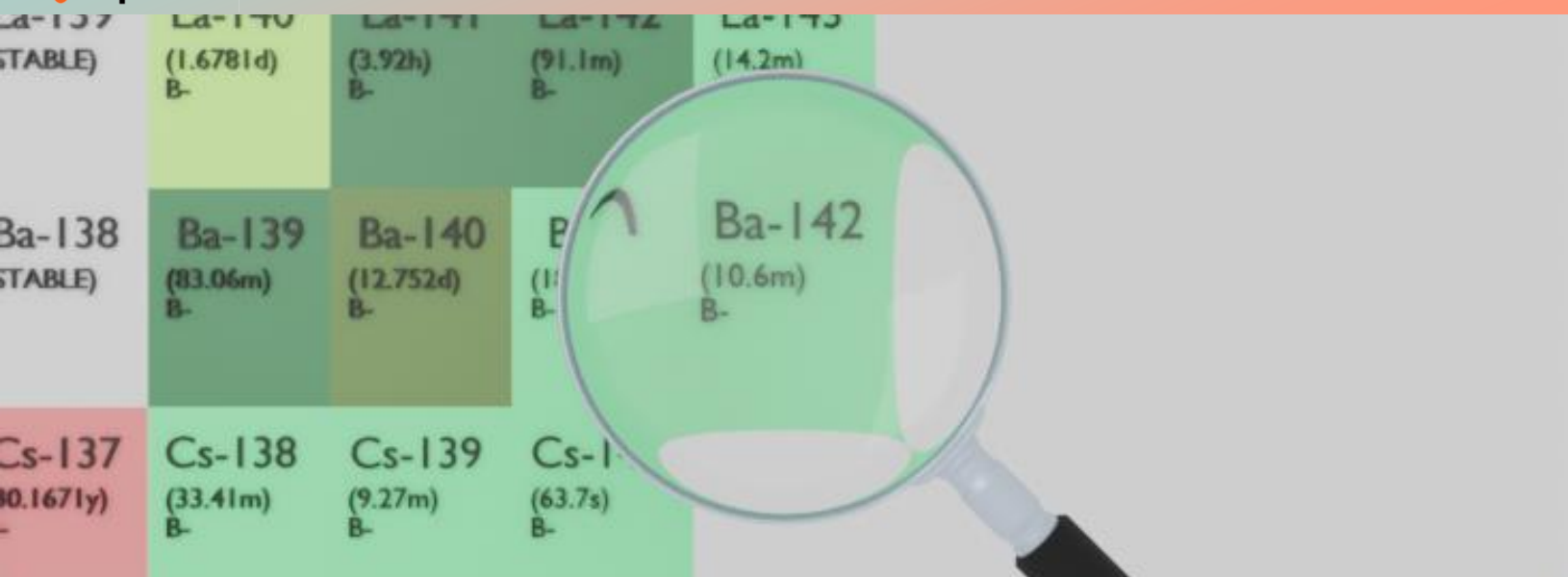




BARIUM-142

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Ba-142
Atomic number (Z): 56
Mass number (A): 142
Neutron number (N): 86

RADIOACTIVE DECAY

Decay modes: β^-
Half-life: 10.6 [m]
Decay constant: 1.0899×10^{-3} [1/s]
Daughters: La-142 (100.0%)
Radioactive daughters: La-142

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.4141 [MeV]
Mean photon energy: 1.04693 [MeV]
Air kerma rate constant, Γ_{10} : 3.786×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.786×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.635×10^{-14} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy $\cdot$ kg/Bq $\cdot$ s]

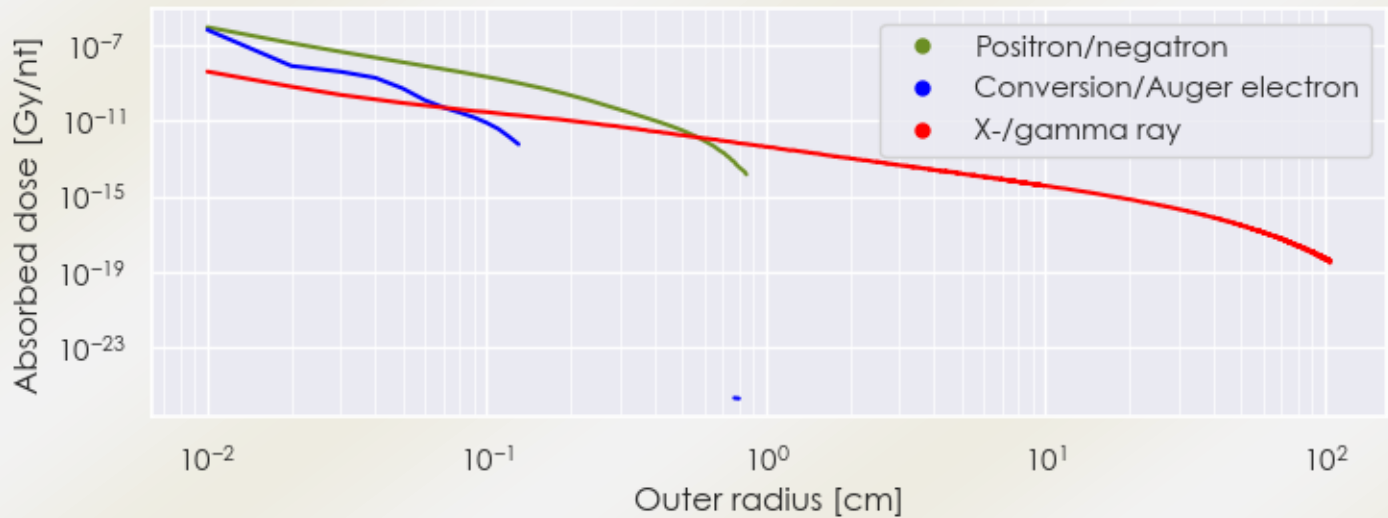
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 6.635×10^{-14} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.677×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

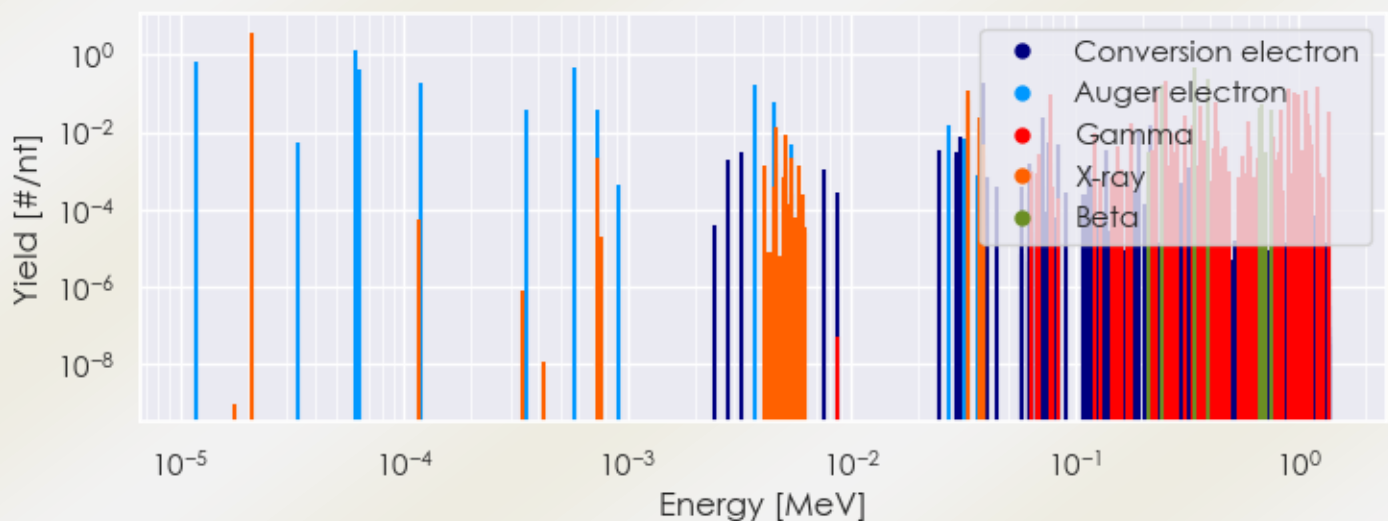
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Ba-142 DPK.csv

SUMMARY SPECTRA (PLOT)

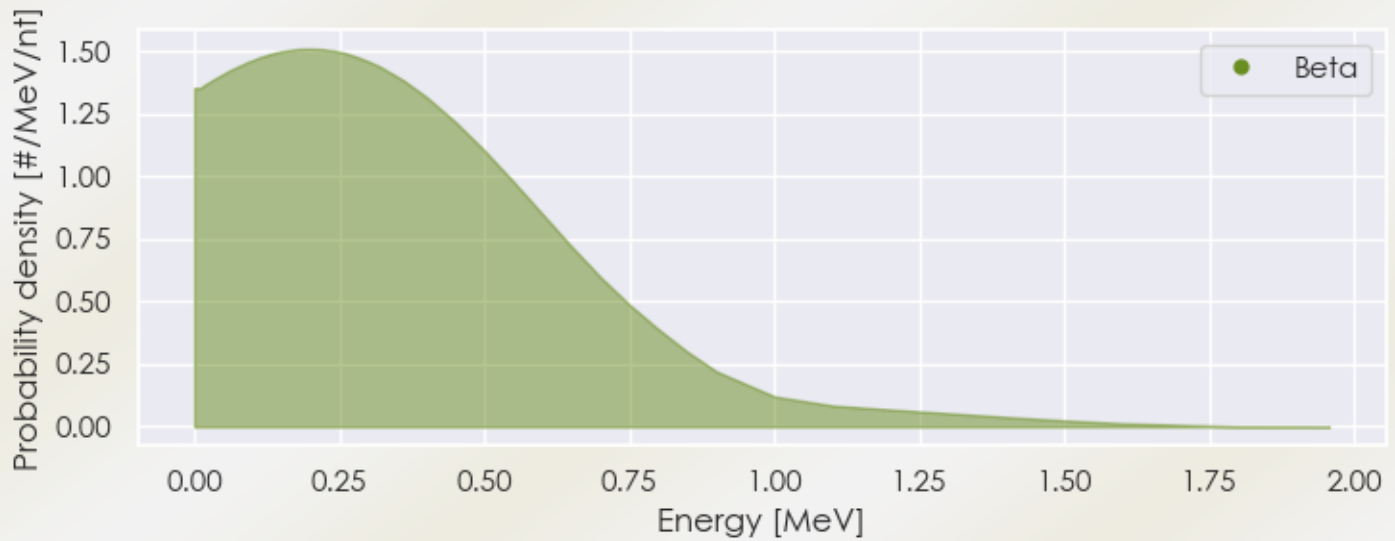
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Ba-142 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/Ba-142 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/Ba-142 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
2.10725e-05	3.764e+00	X-ray
4.63652e-03	1.361e-02	X-ray
3.30405e-02	6.572e-02	X-ray
3.34591e-02	1.207e-01	X-ray
3.77381e-02	1.163e-02	X-ray
3.78203e-02	2.254e-02	X-ray
7.75940e-02	9.775e-02	Gamma
1.77000e-01	1.726e-02	Gamma
2.31611e-01	1.214e-01	Gamma
2.55300e-01	2.052e-01	Gamma

2.86300e-01	1.101e-02	Gamma
3.09200e-01	2.583e-02	Gamma
3.35000e-01	1.466e-02	Gamma
3.63960e-01	4.736e-02	Gamma
4.25040e-01	5.719e-02	Gamma
4.32300e-01	1.024e-02	Gamma
5.99800e-01	1.841e-02	Gamma
8.40400e-01	3.608e-02	Gamma
8.95200e-01	1.386e-01	Gamma
9.49100e-01	1.060e-01	Gamma
1.00120e+00	9.717e-02	Gamma
1.07870e+00	1.146e-01	Gamma
1.09410e+00	2.808e-02	Gamma
1.12680e+00	1.496e-02	Gamma
1.20240e+00	5.535e-02	Gamma
1.20430e+00	1.423e-01	Gamma
1.38020e+00	3.403e-02	Gamma
2.45733e-01	1.585e-01	Beta
3.45885e-01	4.733e-01	Beta
3.97393e-01	2.264e-01	Beta
6.75345e-01	4.425e-02	Beta
6.78579e-01	5.557e-02	Beta
7.54041e-01	3.602e-02	Beta
1.18532e-05	6.576e-01	Auger electron
6.07094e-05	1.311e+00	Auger electron
6.29367e-05	4.144e-01	Auger electron
1.17874e-04	1.847e-01	Auger electron
3.52641e-04	3.885e-02	Auger electron
5.79464e-04	4.408e-01	Auger electron
7.29826e-04	3.801e-02	Auger electron
3.69532e-03	1.733e-01	Auger electron
4.50871e-03	5.730e-02	Auger electron
2.73123e-02	1.510e-02	Auger electron
3.86510e-02	1.915e-01	Conversion electron
7.13522e-02	2.385e-02	Conversion electron
1.92668e-01	1.119e-02	Conversion electron
2.16357e-01	1.449e-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