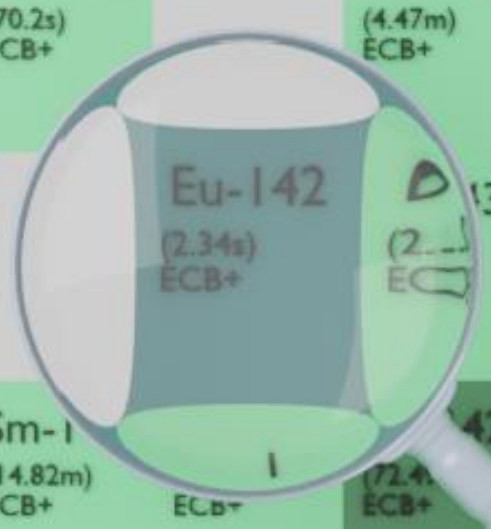




Eu-142 (70.2s) ECB+	Eu-144 (4.47m) ECB+	Eu-145 (23.0m) ECB+	Eu-146 (48.27d) EC	Eu-147 (38.1h) ECB+	
Eu-142 (2.34s) ECB+	Eu-143 (2.3s) EC	Eu-144 (10.2s) ECB+	Eu-145 (5.93d) ECB+	Eu-146 (4.61d) ECB+	
Sm-139 (2.57m) ECB+	Sm-140 (14.82m) ECB+	Sm-141 (72.4s) ECB+	Sm-142 (8.75m) ECB+	Sm-143 (STABLE)	Sm-144 (340d) EC

EUROPIUM-142

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Eu-142
Atomic number (Z): 63
Mass number (A): 142
Neutron number (N): 79

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 2.34 [s]
Decay constant: 2.9622e-01 [1/s]
Daughters: Sm-142 (100.0%)
Radioactive daughters: Sm-142

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 2.76702 [MeV]
Mean photon energy: 1.19703 [MeV]
Air kerma rate constant, Γ_{10} : 8.335e-18 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 4.427e-17 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 4.433e-13 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

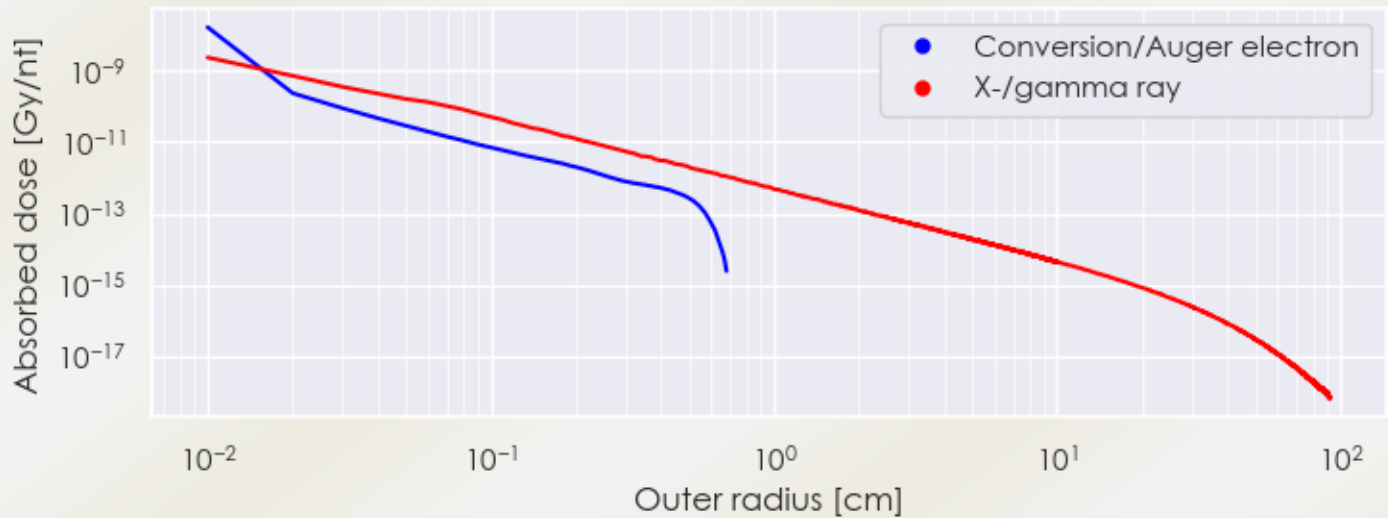
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 4.433e-13 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.918e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

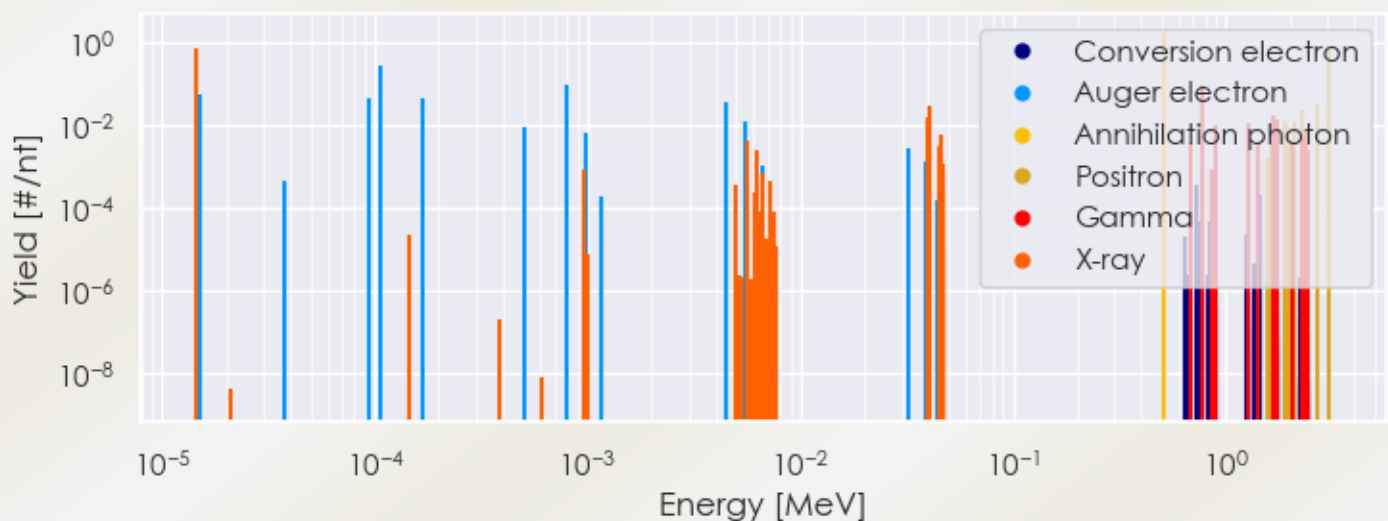
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



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

SUMMARY SPECTRA (PLOT)

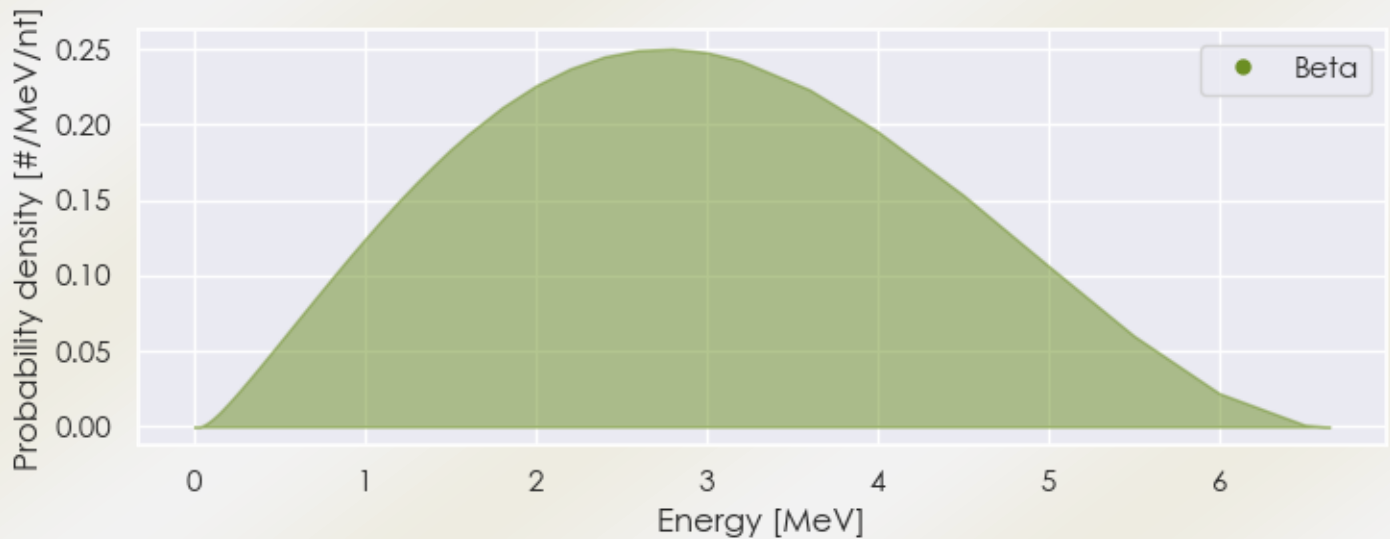
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



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

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.45262e-05	7.258e-01	X-ray
3.95578e-02	1.675e-02	X-ray
4.01680e-02	3.032e-02	X-ray
5.11000e-01	1.857e+00	Annihilation photon
7.68100e-01	1.020e-01	Gamma
8.89800e-01	1.061e-02	Gamma
1.28740e+00	1.163e-02	Gamma
1.65790e+00	1.754e-02	Gamma
1.67130e+00	1.285e-02	Gamma
1.75410e+00	1.489e-02	Gamma

1.88295e+00	1.249e-02	Positron
1.92186e+00	1.039e-02	Positron
2.10270e+00	1.359e-02	Positron
2.29083e+00	2.389e-02	Positron
2.71448e+00	3.398e-02	Positron
3.08271e+00	8.096e-01	Positron
1.51033e-05	5.677e-02	Auger electron
9.42616e-05	4.643e-02	Auger electron
1.06713e-04	3.035e-01	Auger electron
1.68885e-04	4.842e-02	Auger electron
8.03744e-04	1.041e-01	Auger electron
4.45708e-03	3.880e-02	Auger electron
5.50707e-03	1.326e-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