

The image shows a periodic table of isotopes with a magnifying glass highlighting the Co-56 isotope. The table displays various isotopes with their half-lives and decay modes. The highlighted isotope, Co-56, has a half-life of 77.23 days and decays via Electron Capture (ECB+). The magnifying glass is held by a hand, and the background is a light blue grid.

Isotope	Half-life	Decay Mode
Fe-52	8.275h	ECB+
Fe-53	8.51m	ECB+
Fe-54	(STABLE)	
Co-56	77.23d	ECB+
Co-57	(2.1h)	ECB+
Co-58	70.86d	ECB+
Co-59	(STABLE)	
Co-60	5.2713y	B-
Fe-56	(STABLE)	
Fe-57	(STABLE)	
Fe-58	(STABLE)	
Fe-59	44.495d	B-

COBALT-56

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Co-56

Atomic number (Z): 27

Mass number (A): 56

Neutron number (N): 29

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture

Half-life: 77.23 [d]

Decay constant: 1.0388e-07 [1/s]

Daughters: Fe-56 (100.0%)

Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]

Mean electron energy: 0.11983 [MeV]

Mean photon energy: 3.64039 [MeV]

Air kerma rate constant, Γ_{10} : 1.108×10^{-16} [Gy·m²/Bq·s]

Air kerma coefficient, K_{air} : $1.181\text{e-}16$ [$\text{Gy} \cdot \text{m}^2/\text{Bq} \cdot \text{s}$]

Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 1.920e-14 [Gy·kg/Bq·s]

Equilibrium dose constant for alphas, Δ_a : 0.000e+00 [Gy·kg/Bq·s]

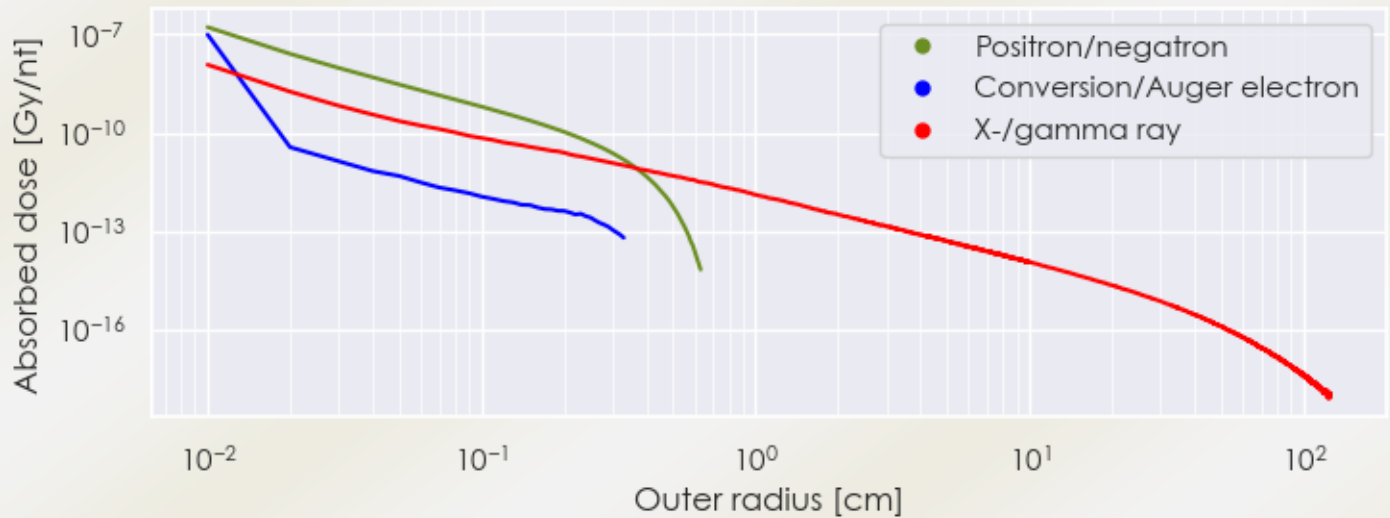
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 1.920e-14 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 5.833e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

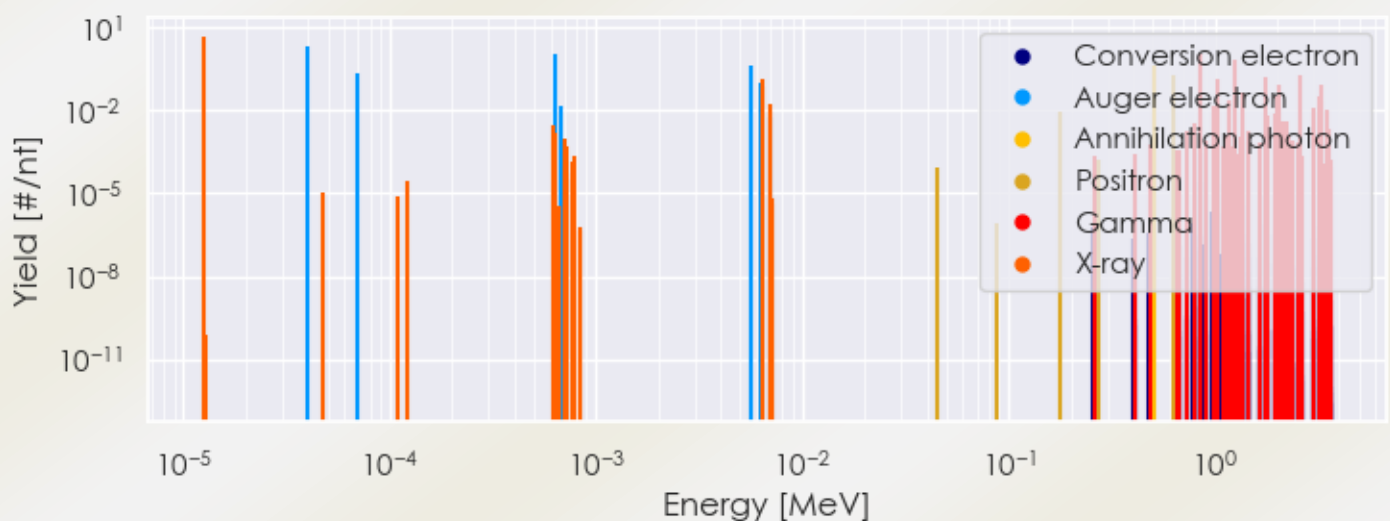
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Co-56 DPK.csv

SUMMARY SPECTRA (PLOT)

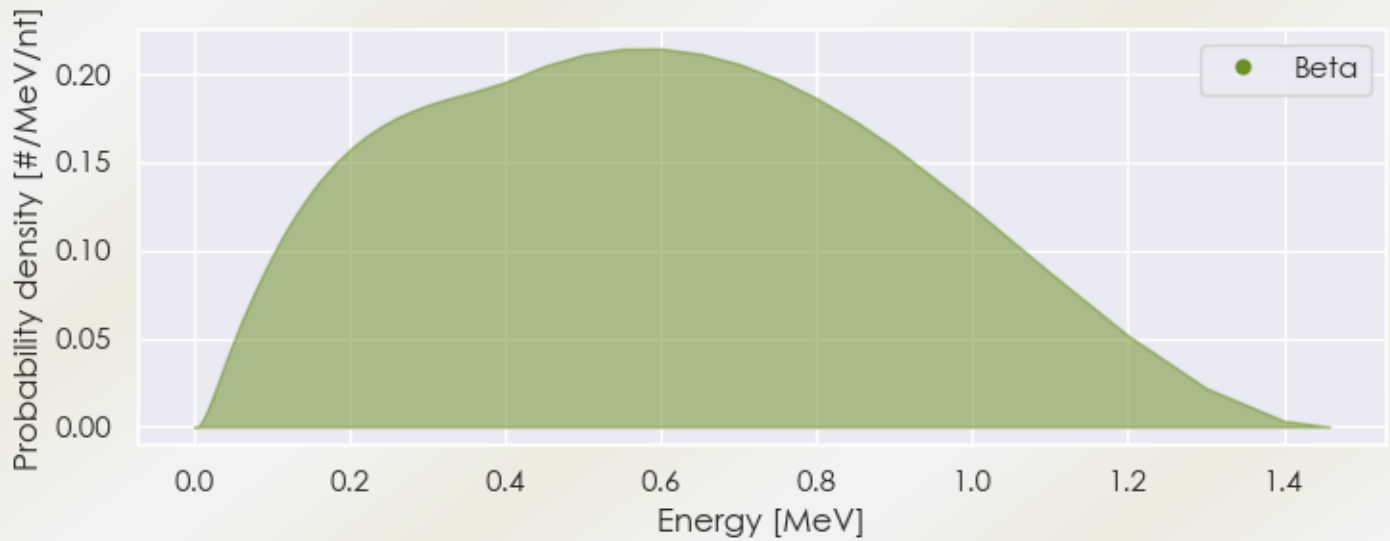
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Co-56 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/Co-56 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/Co-56 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.25307e-05	4.641e+00	X-ray
6.34985e-03	7.283e-02	X-ray
6.36272e-03	1.427e-01	X-ray
7.01694e-03	1.724e-02	X-ray
5.11000e-01	3.805e-01	Annihilation photon
8.46771e-01	9.993e-01	Gamma
9.77373e-01	1.449e-02	Gamma
1.03784e+00	1.417e-01	Gamma
1.17510e+00	2.288e-02	Gamma
1.23828e+00	6.690e-01	Gamma

1.36022e+00	4.290e-02	Gamma
1.77135e+00	1.547e-01	Gamma
2.01518e+00	3.040e-02	Gamma
2.03475e+00	7.890e-02	Gamma
2.59846e+00	1.730e-01	Gamma
3.00960e+00	1.160e-02	Gamma
3.20196e+00	3.320e-02	Gamma
3.25342e+00	8.120e-02	Gamma
3.27299e+00	1.930e-02	Gamma
6.31015e-01	1.810e-01	Positron
4.00261e-05	1.997e+00	Auger electron
6.97184e-05	2.201e-01	Auger electron
6.26760e-04	1.122e+00	Auger electron
6.74044e-04	1.517e-02	Auger electron
5.58186e-03	3.784e-01	Auger electron
6.25798e-03	9.259e-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