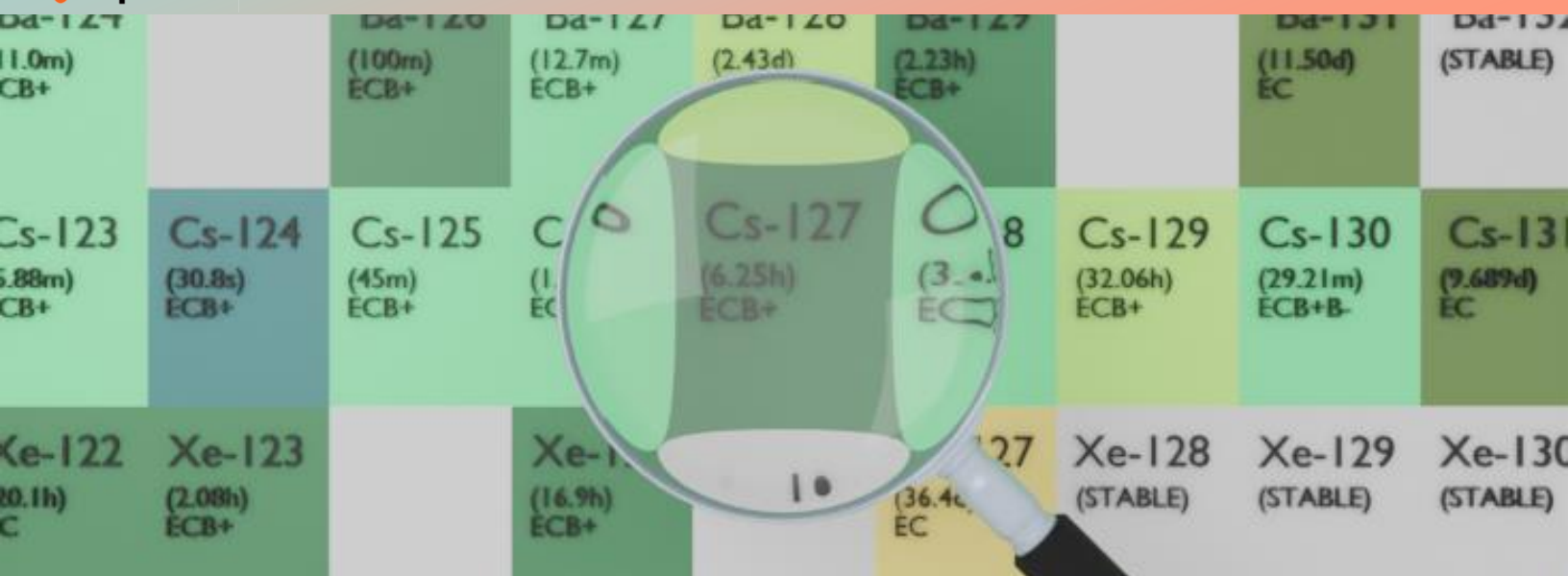




The image shows a periodic table of radionuclides. A magnifying glass is positioned over the cell for Cesium-127 (Cs-127). The cell contains the text: Cs-127, (6.25h), ECB+. The magnifying glass also shows the cell for Cesium-128 (Cs-128) to the right, which contains: Cs-128, (3.05m), EC. The cell for Xenon-127 (Xe-127) is directly below Cs-127 and contains: Xe-127, (36.4d), EC. Other visible cells include Ba-127, Ba-128, Ba-129, Ba-130, Ba-131, Ba-132, Cs-123, Cs-124, Cs-125, Cs-129, Cs-130, Cs-131, Cs-132, Xe-122, Xe-123, Xe-124, Xe-128, Xe-129, Xe-130, Xe-131, Xe-132, Xe-133, Xe-134, Xe-135, Xe-136, Xe-137, Xe-138, Xe-139, Xe-140, Xe-141, Xe-142, Xe-143, Xe-144, Xe-145, Xe-146, Xe-147, Xe-148, Xe-149, Xe-150, Xe-151, Xe-152, Xe-153, Xe-154, Xe-155, Xe-156, Xe-157, Xe-158, Xe-159, Xe-160, Xe-161, Xe-162, Xe-163, Xe-164, Xe-165, Xe-166, Xe-167, Xe-168, Xe-169, Xe-170, Xe-171, Xe-172, Xe-173, Xe-174, Xe-175, Xe-176, Xe-177, Xe-178, Xe-179, Xe-180, Xe-181, Xe-182, Xe-183, Xe-184, Xe-185, Xe-186, Xe-187, Xe-188, Xe-189, Xe-190, Xe-191, Xe-192, Xe-193, Xe-194, Xe-195, Xe-196, Xe-197, Xe-198, Xe-199, Xe-200, Xe-201, Xe-202, Xe-203, Xe-204, Xe-205, Xe-206, Xe-207, Xe-208, Xe-209, Xe-210, Xe-211, Xe-212, Xe-213, Xe-214, Xe-215, Xe-216, Xe-217, Xe-218, Xe-219, Xe-220, Xe-221, Xe-222, Xe-223, Xe-224, Xe-225, Xe-226, Xe-227, Xe-228, Xe-229, Xe-230, Xe-231, Xe-232, 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CESIUM-127

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Cs-127
Atomic number (Z): 55
Mass number (A): 127
Neutron number (N): 72

RADIOACTIVE DECAY

Decay modes: β^+ , Electron capture
Half-life: 6.25 [h]
Decay constant: 3.0807×10^{-5} [1/s]
Daughters: Xe-127 (100.0%)
Radioactive daughters: Xe-127

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.02934 [MeV]
Mean photon energy: 0.43336 [MeV]
Air kerma rate constant, Γ_{10} : 1.858×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 1.976×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 4.701×10^{-15} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

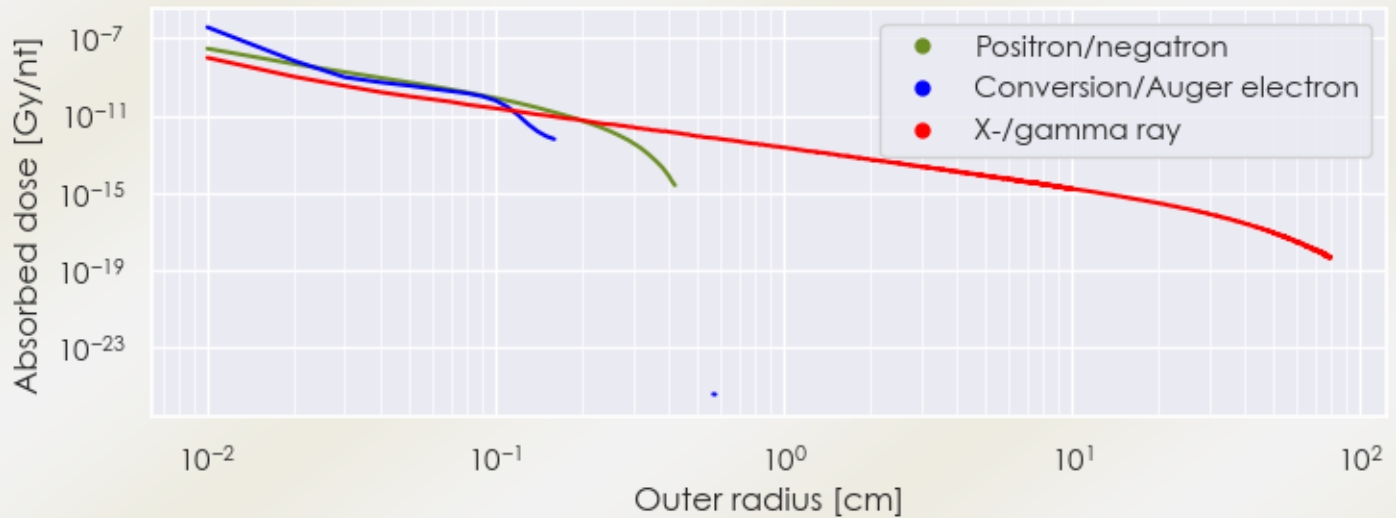
Equilibrium dose constant for betas/electrons, $\Delta_{\beta,\beta^+,e^-}$: 4.701e-15 [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 6.943e-14 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

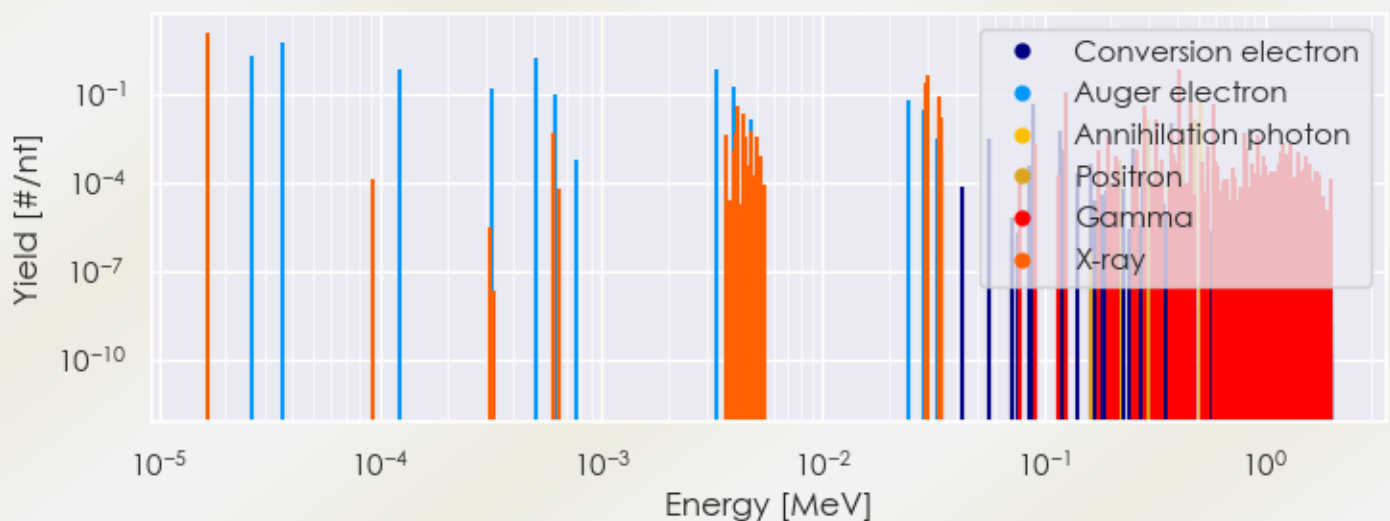
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Cs-127 DPK.csv

SUMMARY SPECTRA (PLOT)

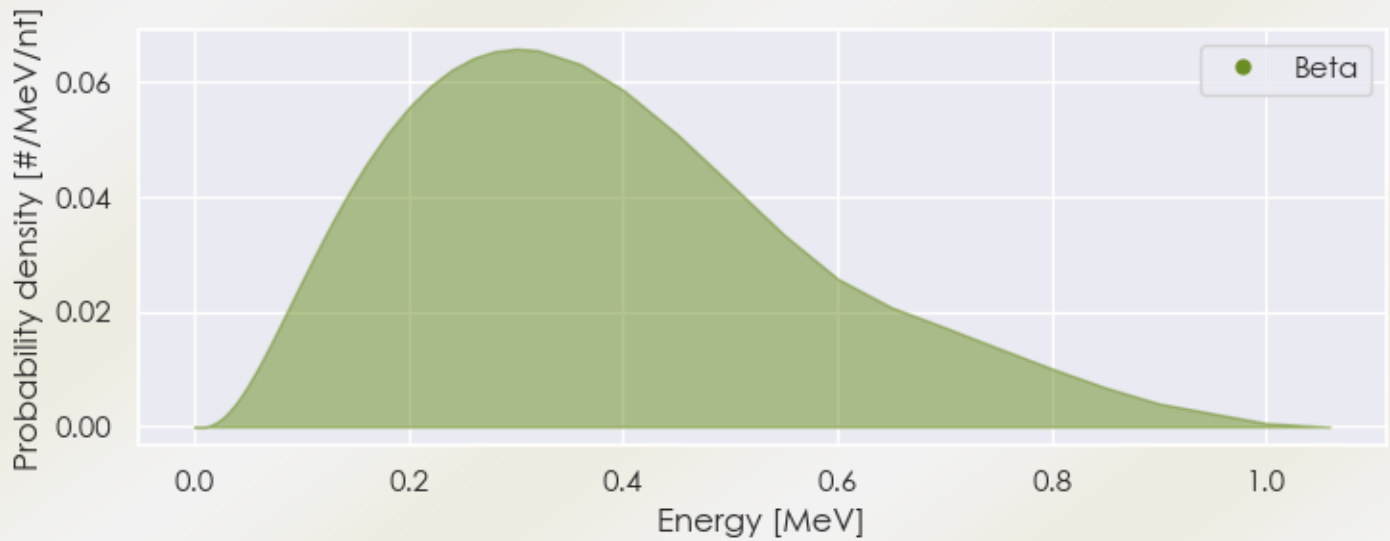
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Cs-127 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/Cs-127 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/Cs-127 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
1.66177e-05	1.234e+01	X-ray
4.09719e-03	3.942e-02	X-ray
4.41300e-03	2.287e-02	X-ray
2.94521e-02	2.271e-01	X-ray
2.97812e-02	4.206e-01	X-ray
3.35665e-02	3.948e-02	X-ray
3.36295e-02	7.655e-02	X-ray
3.44080e-02	1.615e-02	X-ray
1.24700e-01	1.137e-01	Gamma
2.87160e-01	3.825e-02	Gamma

3.21540e-01	1.306e-02	Gamma
4.11950e-01	6.280e-01	Gamma
4.62310e-01	5.074e-02	Gamma
5.11000e-01	6.108e-02	Annihilation photon
5.87010e-01	4.208e-02	Gamma
2.96288e-01	1.314e-02	Positron
4.76761e-01	1.264e-02	Positron
2.61927e-05	1.924e+00	Auger electron
3.62444e-05	5.866e+00	Auger electron
1.23738e-04	7.241e-01	Auger electron
3.22357e-04	1.396e-01	Auger electron
5.05191e-04	1.606e+00	Auger electron
6.17505e-04	9.195e-02	Auger electron
3.32576e-03	6.330e-01	Auger electron
4.00312e-03	1.878e-01	Auger electron
4.70752e-03	1.427e-02	Auger electron
2.44715e-02	6.385e-02	Auger electron
2.86854e-02	2.857e-02	Auger electron
9.01440e-02	4.411e-02	Conversion electron
3.77394e-01	1.001e-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/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6