



Fe-52 (8.275h) ECB+	Fe-53 (8.51m) ECB+	Fe-54 (STABLE)	Fe-55 (2.737m)	Fe-56 (STABLE)	Fe-57 (STABLE)	Fe-58 (STABLE)	Fe-59 (44.495d) B-
Mn-51 (46.2m) ECB+	Mn-52 (5.591d) ECB+	Mn-53 (3.7d) ECB+	Mn-54 (312.12d) ECB+B-	Mn-55 (STABLE)	Mn-56 (2.5789h) B-	Mn-57 (85.4s) B-	
Cr-49 (2.3m) CB+	Cr-50 (STABLE)	Cr-51 (27.7025d) EC	Cr-52 (STABLE)	Cr-53 (STABLE)	Cr-54 (STABLE)	Cr-55 (3.497m) B-	Cr-56 (5.94m) B-

MANGANESE-54

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Mn-54
Atomic number (Z): 25
Mass number (A): 54
Neutron number (N): 29

RADIOACTIVE DECAY

Decay modes: β^- , β^+ , Electron capture
Half-life: 312.1 [d]
Decay constant: 2.5703×10^{-8} [1/s]
Daughters: Cr-54 (100.0%), Fe-54 (0.00029%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.0042 [MeV]
Mean photon energy: 0.836 [MeV]
Air kerma rate constant, Γ_{10} : 3.058×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Air kerma coefficient, K_{air} : 3.058×10^{-17} [Gy $\cdot$ m²/Bq $\cdot$ s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.729×10^{-16} [Gy $\cdot$ kg/Bq $\cdot$ s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000×10^0 [Gy $\cdot$ kg/Bq $\cdot$ s]

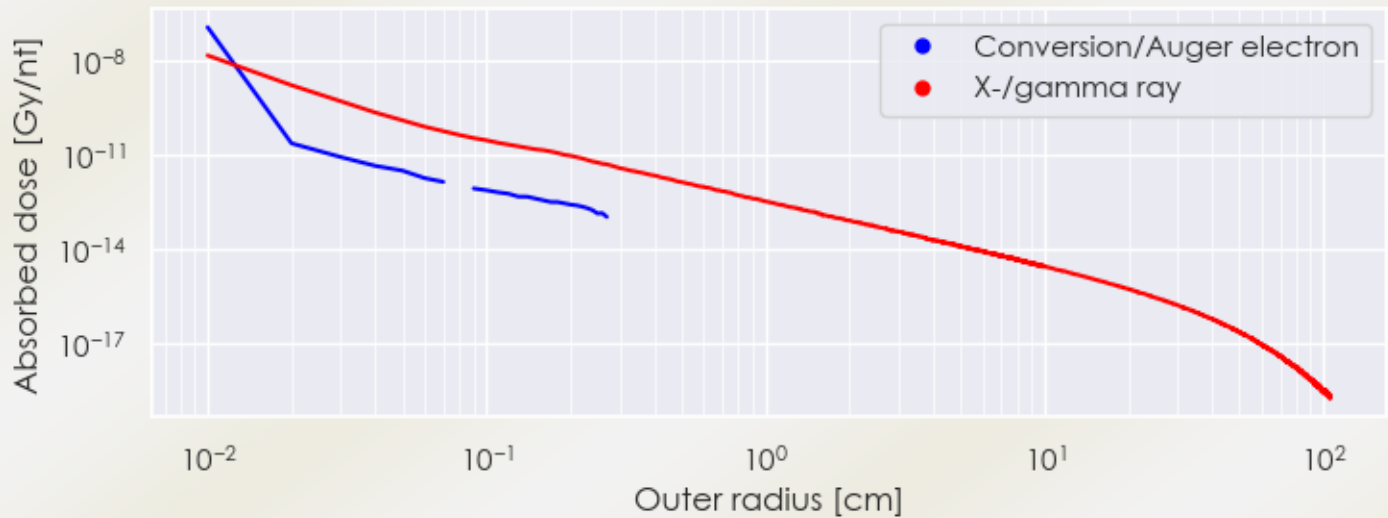
Equilibrium dose constant for betas/electrons, $\Delta_{\beta-, \beta+, e-}$: 6.729×10^{-16} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 1.339×10^{-13} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

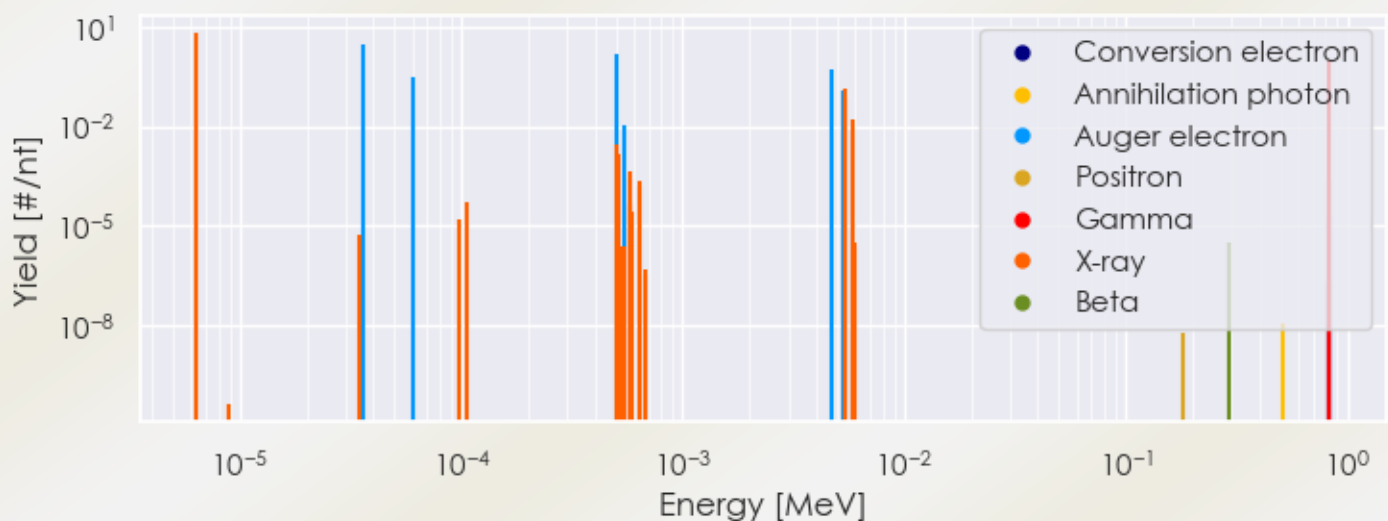
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Mn-54 DPK.csv

SUMMARY SPECTRA (PLOT)

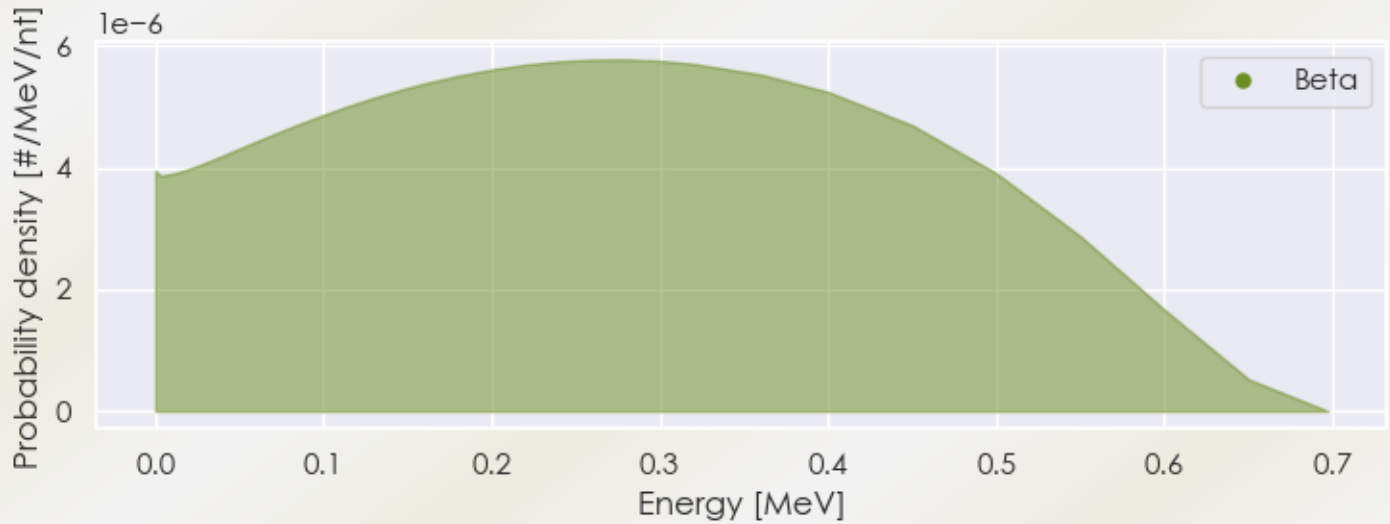
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Mn-54 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/Mn-54 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/Mn-54 Summary Spectrum.csv

Energy [MeV]	Yield [# / nt] if > 0.01	Radiation type
6.39125e-06	6.422e+00	X-ray
5.36786e-03	7.338e-02	X-ray
5.37679e-03	1.440e-01	X-ray
5.90738e-03	1.662e-02	X-ray
8.34848e-01	9.998e-01	Gamma
3.61088e-05	3.016e+00	Auger electron
6.10580e-05	2.939e-01	Auger electron
5.00653e-04	1.455e+00	Auger electron
5.44257e-04	1.096e-02	Auger electron
4.74513e-03	5.191e-01	Auger electron

5.29315e-03

1.197e-01

[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/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6