



Fe-52 (8.275h) ECB+	Fe-53 (8.51m) ECB+	Fe-54 (STABLE)	Fe-55 (2.737y) EC	Fe-56 (STABLE)	Fe-57 (STABLE)	Fe-58 (STABLE)
Mn-51 (46.2m) ECB+	Mn-52 (5.59m) EC	Mn-53 (3.7E+6y) EC	Mn-54 (3.12m) EC	Mn-55 (STABLE)	Mn-56 (2.5789h) B-	Mn-57 (85.4s) B-
Cr-48 (21.56h) CB+	Cr-49 (42.3m) ECB+	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-53

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Mn-53
Atomic number (Z): 25
Mass number (A): 53
Neutron number (N): 28

RADIOACTIVE DECAY

Decay modes: Electron capture
Half-life: 3700000.0 [y]
Decay constant: 5.9365e-15 [1/s]
Daughters: Cr-53 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.00398 [MeV]
Mean photon energy: 0.00135 [MeV]
Air kerma rate constant, Γ_{10} : 0.000e+00 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air} : 0.000e+00 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (α and/or electrons), Δ_{wp} : 6.377e-16 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{α} : 0.000e+00 [Gy·kg/Bq·s]

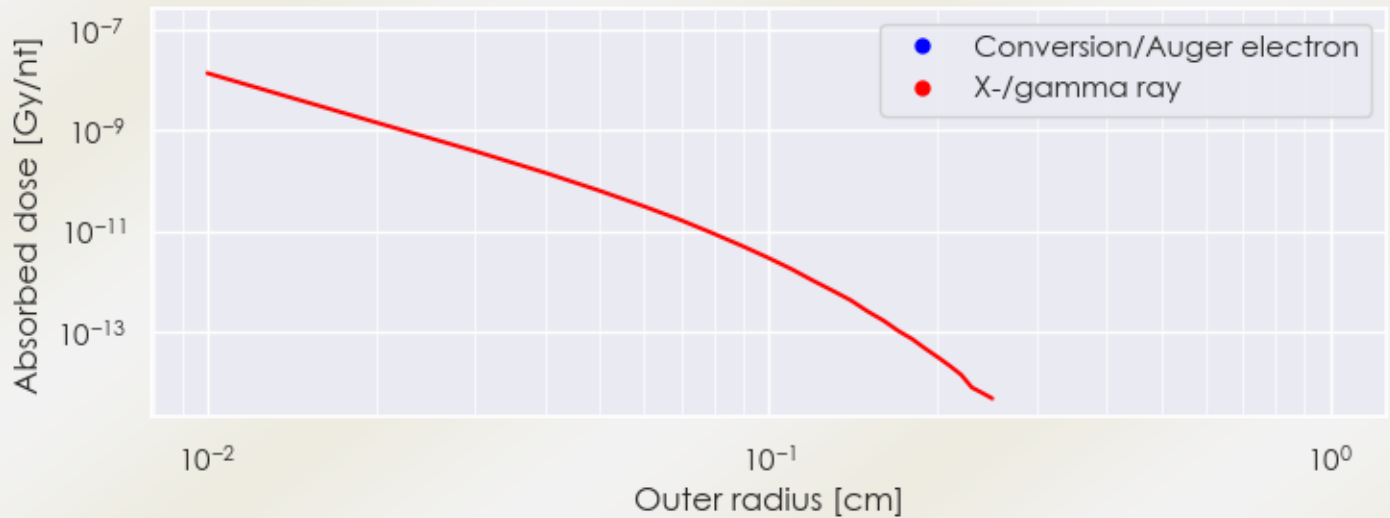
Equilibrium dose constant for betas/electrons, $\Delta_{\beta, \beta^+, e^-}$: 6.377×10^{-16} [Gy·kg/Bq·s]

Equilibrium dose constant for photons, Δ_p : 2.163×10^{-16} [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

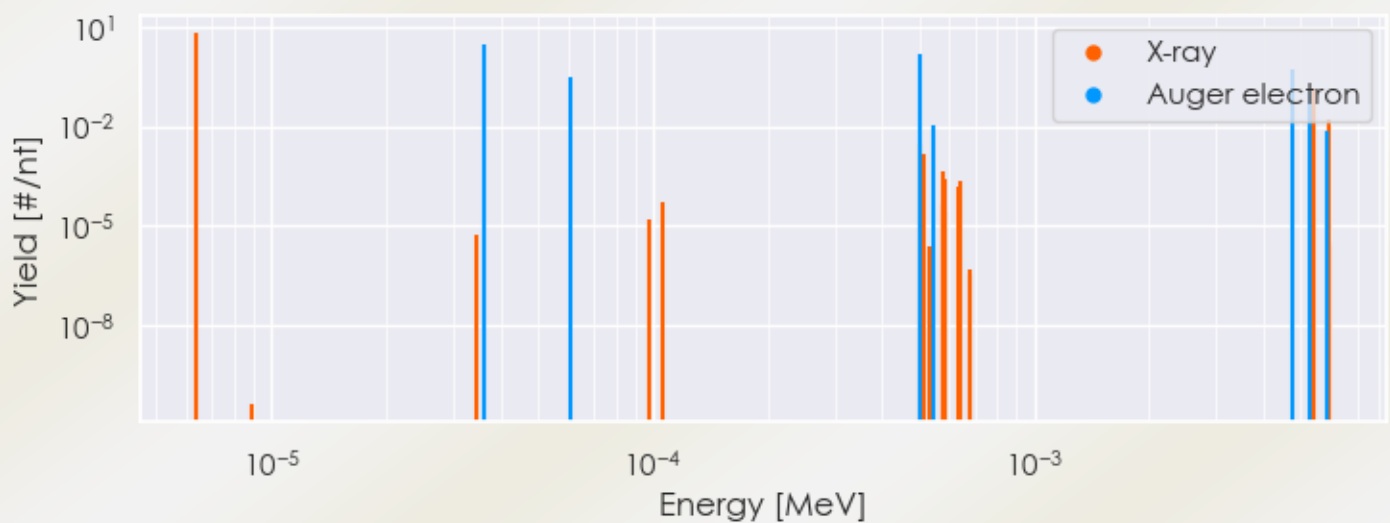
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Mn-53 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-53 Summary 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-53 Summary Spectrum.csv

Energy [MeV]	Yield [# /n] if > 0.01	Radiation type
6.39125e-06	6.415e+00	X-ray
5.36786e-03	7.313e-02	X-ray
5.37679e-03	1.435e-01	X-ray
5.90738e-03	1.656e-02	X-ray
3.61071e-05	3.013e+00	Auger electron
6.10580e-05	2.943e-01	Auger electron
5.00661e-04	1.453e+00	Auger electron
5.44299e-04	1.095e-02	Auger electron
4.74513e-03	5.173e-01	Auger electron
5.29315e-03	1.193e-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/SNMMI-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6