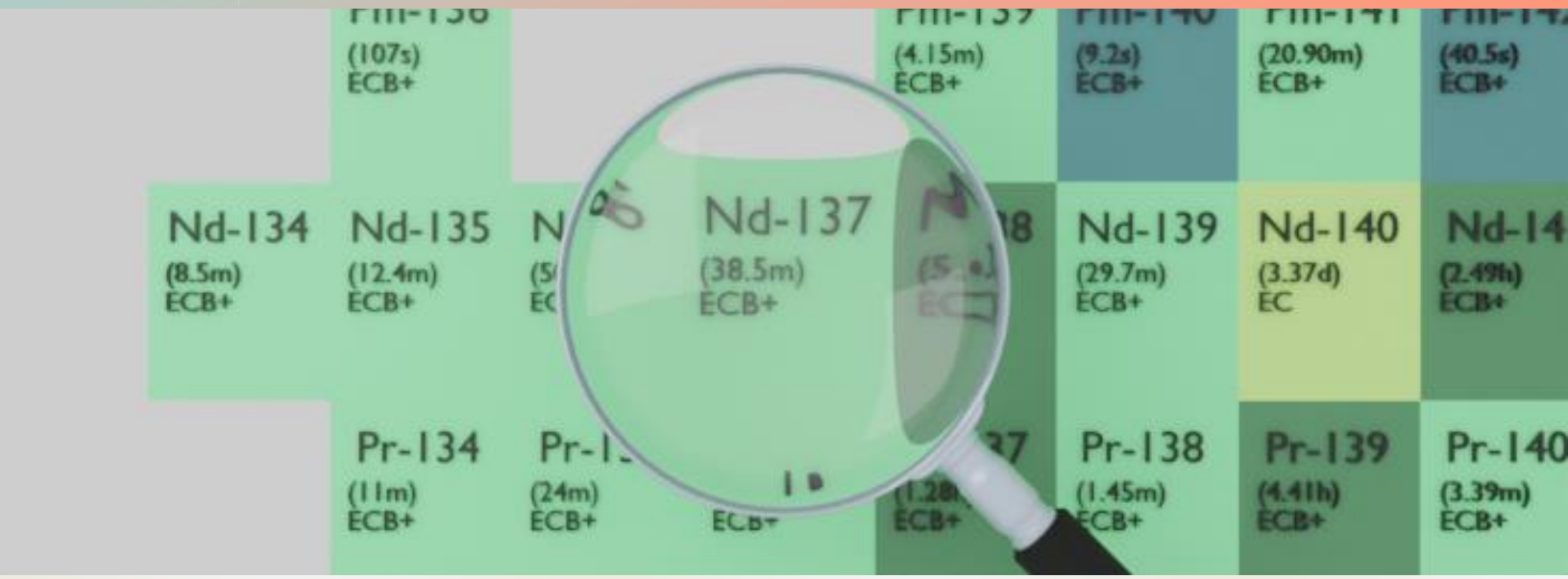


NEODYMIUM-137

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Nd-137
Atomic number (Z): 60
Mass number (A): 137
Neutron number (N): 77

RADIOACTIVE DECAY

Decay modes: β+, Electron capture
Half-life: 38.5 [m]
Decay constant: 3.0006e-04 [1/s]
Daughters: Pr-137 (100.0%)
Radioactive daughters: Pr-137

DOSIMETRIC CONSTANTS

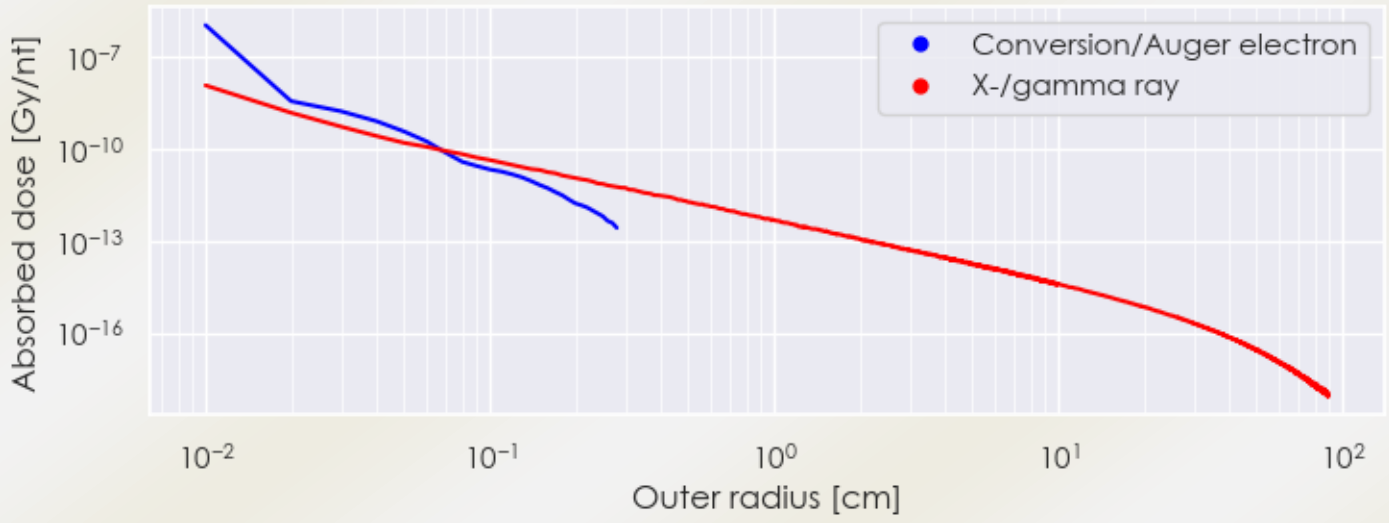
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.32466 [MeV]
Mean photon energy: 1.17894 [MeV]
Air kerma rate constant, Γ_{10}: 3.292e-17 [Gy·m^2/Bq·s]
Air kerma coefficient, K_{air}: 4.473e-17 [Gy·m^2/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}: 5.202e-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, $\Delta_{\beta-,\beta+,e-}$: 5.202e-14 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 1.889e-13 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

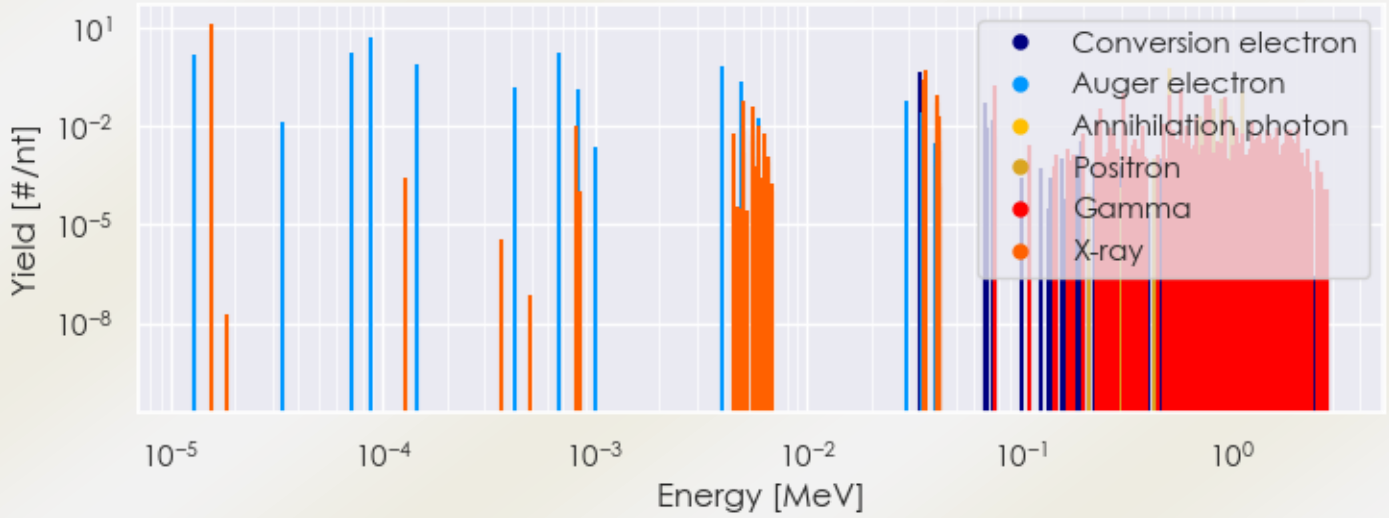
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Nd-137 DPK.csv

SUMMARY SPECTRA (PLOT)

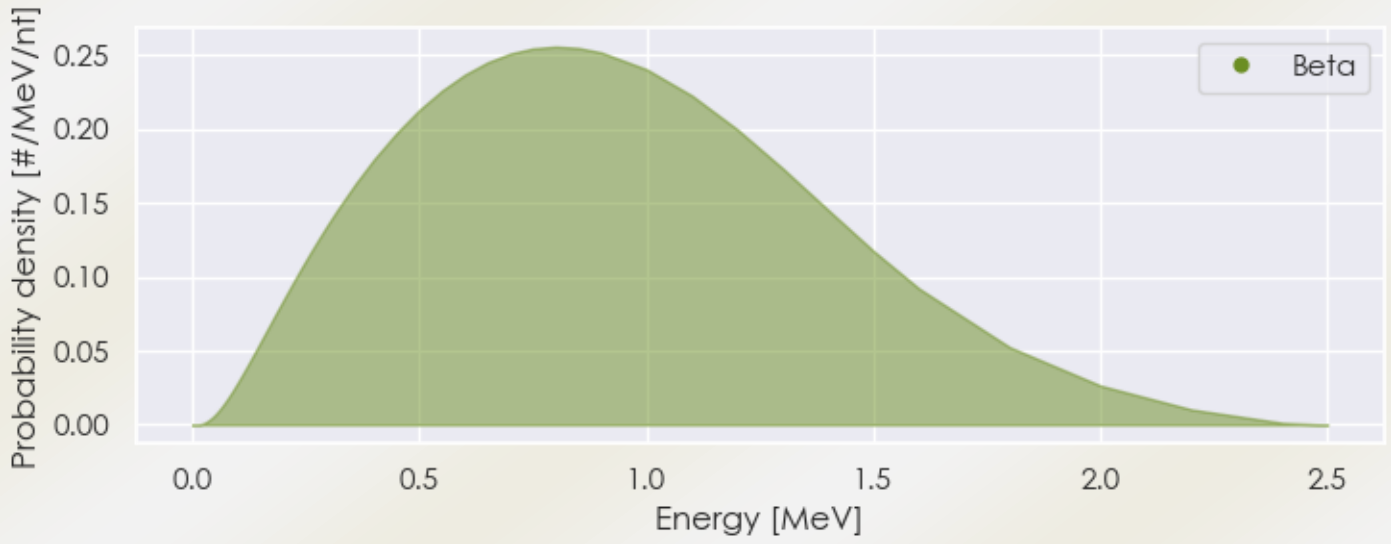
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: www.mirdsoft.org/products/MIRDspecs/Nd-137 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/Nd-137 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/Nd-137 Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
1.56198e-05	1.376e+01	X-ray
8.16858e-04	1.050e-02	X-ray
5.01953e-03	6.140e-02	X-ray
5.48692e-03	3.772e-02	X-ray
5.83581e-03	1.005e-02	X-ray
3.55671e-02	2.733e-01	X-ray
3.60557e-02	4.991e-01	X-ray
4.06843e-02	4.892e-02	X-ray
4.07816e-02	9.470e-02	X-ray
4.17693e-02	1.046e-02	X-ray

4.17904e-02	2.033e-02	X-ray
7.55000e-02	1.702e-01	Gamma
2.30500e-01	1.280e-02	Gamma
2.38200e-01	3.520e-02	Gamma
3.06600e-01	9.984e-02	Gamma
3.82000e-01	1.024e-02	Gamma
4.74900e-01	1.152e-02	Gamma
5.05100e-01	8.960e-02	Gamma
5.11000e-01	6.102e-01	Annihilation photon
5.80600e-01	1.280e-01	Gamma
6.15600e-01	1.037e-02	Gamma
6.86100e-01	1.792e-02	Gamma
7.61600e-01	8.960e-02	Gamma
7.81600e-01	9.344e-02	Gamma
9.25900e-01	7.296e-02	Gamma
9.29200e-01	2.944e-02	Gamma
1.24310e+00	1.408e-02	Gamma
7.09273e-01	1.993e-02	Positron
7.73980e-01	2.890e-02	Positron
8.16953e-01	3.288e-02	Positron
8.98668e-01	7.274e-02	Positron
9.88830e-01	1.993e-02	Positron
1.12884e+00	1.096e-01	Positron
1.29601e-05	1.608e+00	Auger electron
3.35201e-05	1.306e-02	Auger electron
7.04437e-05	1.720e+00	Auger electron
8.72015e-05	4.834e+00	Auger electron
1.42945e-04	7.634e-01	Auger electron
4.14022e-04	1.594e-01	Auger electron
6.67576e-04	1.782e+00	Auger electron
8.25664e-04	1.260e-01	Auger electron
3.99632e-03	6.822e-01	Auger electron
4.89950e-03	2.272e-01	Auger electron
5.83588e-03	1.861e-02	Auger electron
2.93378e-02	5.569e-02	Auger electron
3.34900e-02	4.329e-01	Conversion electron
3.45832e-02	2.649e-02	Auger electron
6.87002e-02	5.412e-02	Conversion electron

6.90571e-02	1.144e-02	Conversion electron
7.42716e-02	1.612e-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