RHODIUM-103M

SUMMARY DATA

GENERAL

CLASSIFICATION

Isotope: Rh-103m
Atomic number (Z): 45
Mass number (A): 103
Neutron number (N): 58

RADIOACTIVE DECAY

Decay modes: Internal transition
Half-life: 56.11 [m]
Decay constant: 2.0587e-04 [1/s]
Daughters: Rh-103 (100.0%)
Radioactive daughters: None

DOSIMETRIC CONSTANTS

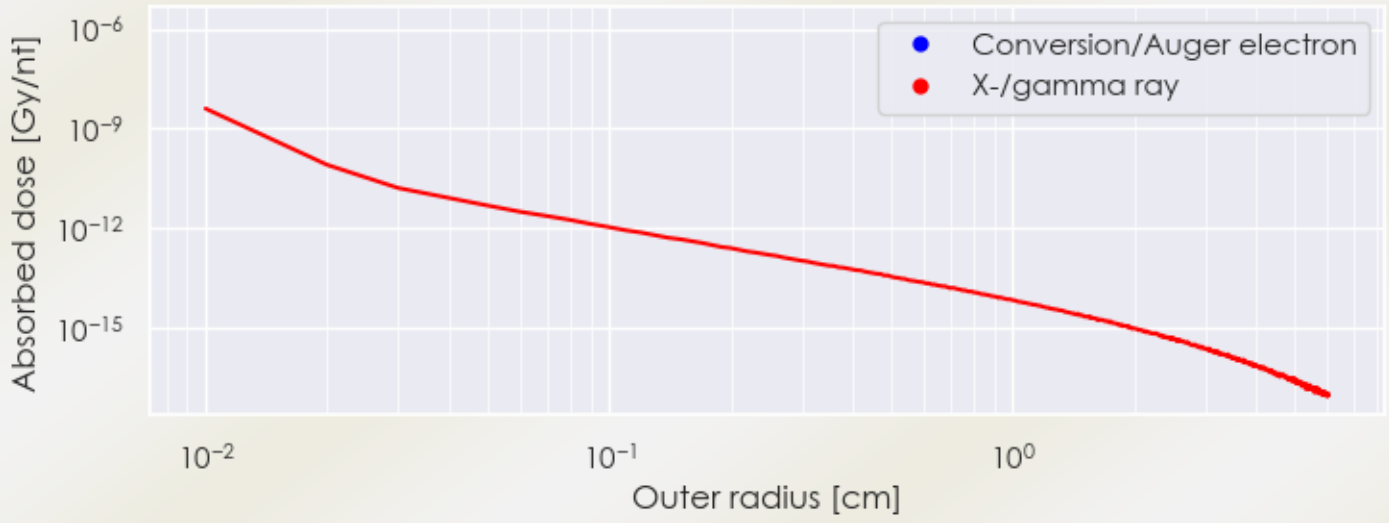
Mean alpha energy: 0.0 [MeV]
Mean electron energy: 0.03768 [MeV]
Mean photon energy: 0.00172 [MeV]
Air kerma rate constant, Γ_{10}*:* 9.615e-19 [Gy·m²/Bq·s]
Air kerma coefficient, K_{air}*:* 9.615e-19 [Gy·m²/Bq·s]
Equilibrium dose constant for weakly-penetrating radiations (a and/or electrons), Δ_{wp}*:* 6.037e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for alphas, Δ_{a}*:* 0.000e+00 [Gy·kg/Bq·s]

Equilibrium dose constant for betas/electrons, $\Delta_{\beta-,\beta+,e-}$: 6.037e-15 [Gy·kg/Bq·s]
Equilibrium dose constant for photons, Δ_{p}: 2.756e-16 [Gy·kg/Bq·s]

DOSE POINT KERNELS (PLOT)

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

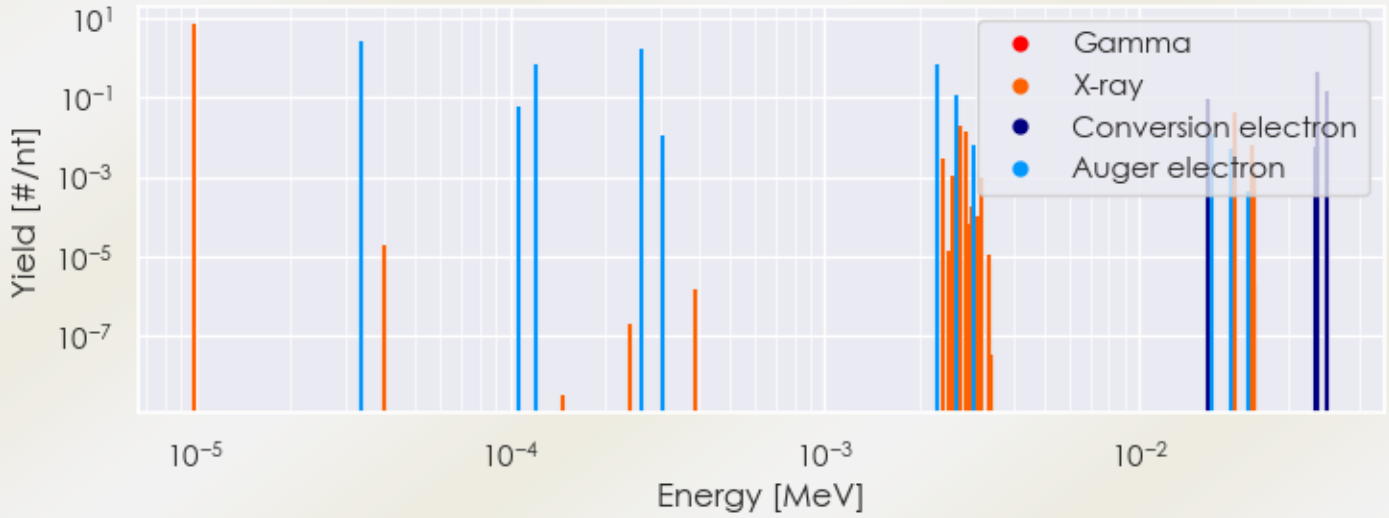
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: www.mirdsoft.org/products/MIRDspecs/Rh-103m 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/Rh-103m 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/Rh-103m Summary Spectrum.csv

Energy [MeV]	Yield [#/nt] if > 0.01	Radiation type
9.96021e-06	6.870e+00	X-ray
2.68654e-03	1.946e-02	X-ray
2.82848e-03	1.334e-02	X-ray
2.00395e-02	2.124e-02	X-ray
2.01865e-02	4.021e-02	X-ray
3.36057e-05	2.713e+00	Auger electron
1.06422e-04	6.003e-02	Auger electron
1.20373e-04	6.867e-01	Auger electron
2.60193e-04	1.617e+00	Auger electron
3.05253e-04	1.046e-02	Auger electron
2.26948e-03	6.484e-01	Auger electron
2.60930e-03	1.201e-01	Auger electron
1.65640e-02	9.104e-02	Conversion electron
1.69094e-02	1.223e-02	Auger electron
3.66035e-02	2.989e-01	Conversion electron
3.67505e-02	4.213e-01	Conversion electron
3.92603e-02	1.496e-01	Conversion electron
3.97550e-02	2.433e-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