



# IODINE-125

## SUMMARY DATA

### GENERAL

#### CLASSIFICATION

Isotope: I-125  
Atomic number (Z): 53  
Mass number (A): 125  
Neutron number (N): 72

#### RADIOACTIVE DECAY

Decay modes: Electron capture  
Half-life: 59.4 [d]  
Decay constant:  $1.3506 \times 10^{-7}$  [1/s]  
Daughters: Te-125 (100.0%)  
Radioactive daughters: None

#### DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]  
Mean electron energy: 0.01923 [MeV]  
Mean photon energy: 0.04283 [MeV]  
Air kerma rate constant,  $\Gamma_{10}$ :  $9.856 \times 10^{-18}$  [Gy  $\cdot$  m<sup>2</sup>/Bq  $\cdot$  s]  
Air kerma coefficient,  $K_{\text{air}}$ :  $9.856 \times 10^{-18}$  [Gy  $\cdot$  m<sup>2</sup>/Bq  $\cdot$  s]  
Equilibrium dose constant for weakly-penetrating radiations ( $\alpha$  and/or electrons),  $\Delta_{\text{wp}}$ :  $3.081 \times 10^{-15}$  [Gy  $\cdot$  kg/Bq  $\cdot$  s]  
Equilibrium dose constant for alphas,  $\Delta_{\alpha}$ : 0.000e+00 [Gy  $\cdot$  kg/Bq  $\cdot$  s]

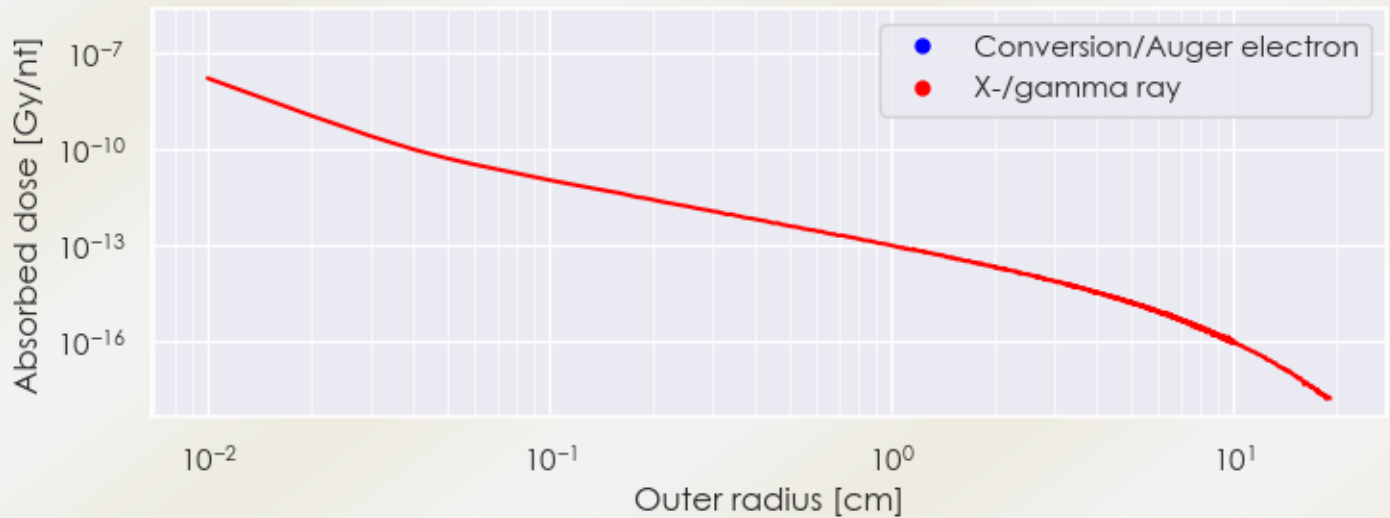
Equilibrium dose constant for betas/electrons,  $\Delta_{\beta, \beta+, e^-}$ :  $3.081 \times 10^{-15}$  [Gy·kg/Bq·s]

Equilibrium dose constant for photons,  $\Delta_p$ :  $6.862 \times 10^{-15}$  [Gy·kg/Bq·s]

## DOSE POINT KERNELS (PLOT)

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

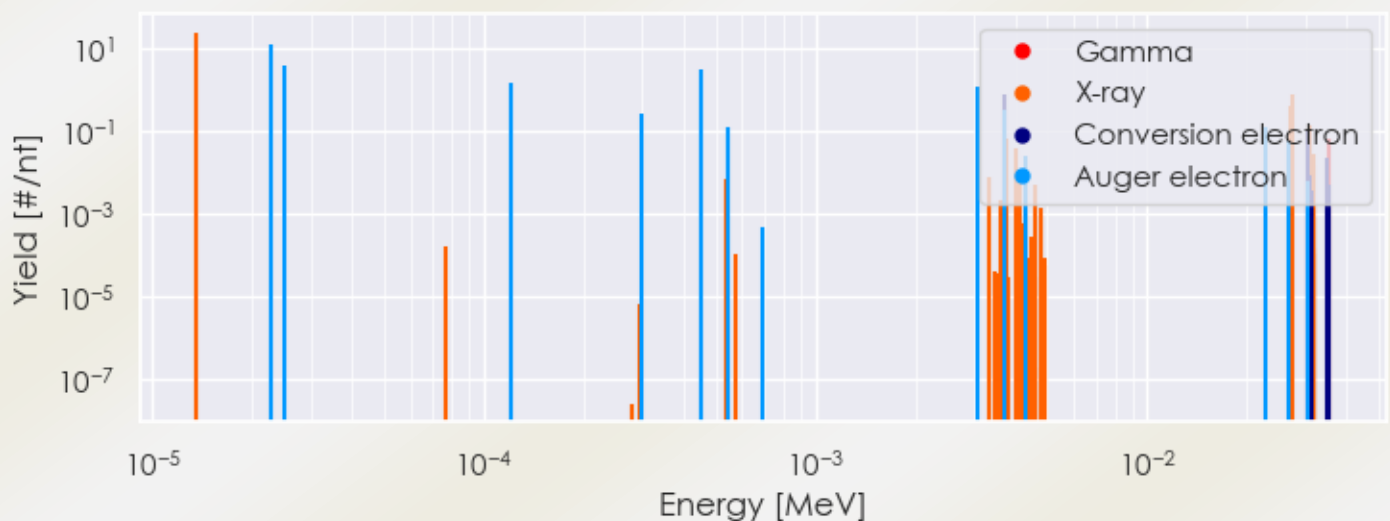
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: [www.mirdsoft.org/products/MIRDspecs/I-125 DPK.csv](http://www.mirdsoft.org/products/MIRDspecs/I-125 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/I-125 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/I-125 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/I-125 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/I-125%20Summary%20Spectrum.csv)

| Energy [MeV] | Yield [# / n <sub>t</sub> ] if > 0.01 | Radiation type      |
|--------------|---------------------------------------|---------------------|
| 1.36106e-05  | 2.497e+01                             | X-ray               |
| 3.75695e-03  | 6.476e-02                             | X-ray               |
| 4.02446e-03  | 3.757e-02                             | X-ray               |
| 2.71868e-02  | 4.052e-01                             | X-ray               |
| 2.74652e-02  | 7.544e-01                             | X-ray               |
| 3.09378e-02  | 6.946e-02                             | X-ray               |
| 3.09901e-02  | 1.347e-01                             | X-ray               |
| 3.16740e-02  | 1.439e-02                             | X-ray               |
| 3.16841e-02  | 2.828e-02                             | X-ray               |
| 3.54922e-02  | 6.680e-02                             | Gamma               |
| 2.29271e-05  | 1.220e+01                             | Auger electron      |
| 2.49224e-05  | 4.085e+00                             | Auger electron      |
| 1.20899e-04  | 1.410e+00                             | Auger electron      |
| 2.99843e-04  | 2.760e-01                             | Auger electron      |
| 4.49679e-04  | 3.125e+00                             | Auger electron      |
| 5.41735e-04  | 1.205e-01                             | Auger electron      |
| 3.08817e-03  | 1.226e+00                             | Auger electron      |
| 3.68276e-03  | 3.475e-01                             | Auger electron      |
| 3.68720e-03  | 8.080e-01                             | Conversion electron |
| 4.29994e-03  | 2.459e-02                             | Auger electron      |
| 2.26653e-02  | 1.310e-01                             | Auger electron      |
| 2.65056e-02  | 5.769e-02                             | Auger electron      |
| 3.05780e-02  | 9.686e-02                             | Conversion electron |
| 3.46773e-02  | 2.204e-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/SNMML-MAIN/iCore/Store/StoreLayouts/Item\\_Detail.aspx?iProductCode=0-932004-80-6](https://sites.snmmi.org/SNMML-MAIN/iCore/Store/StoreLayouts/Item_Detail.aspx?iProductCode=0-932004-80-6)