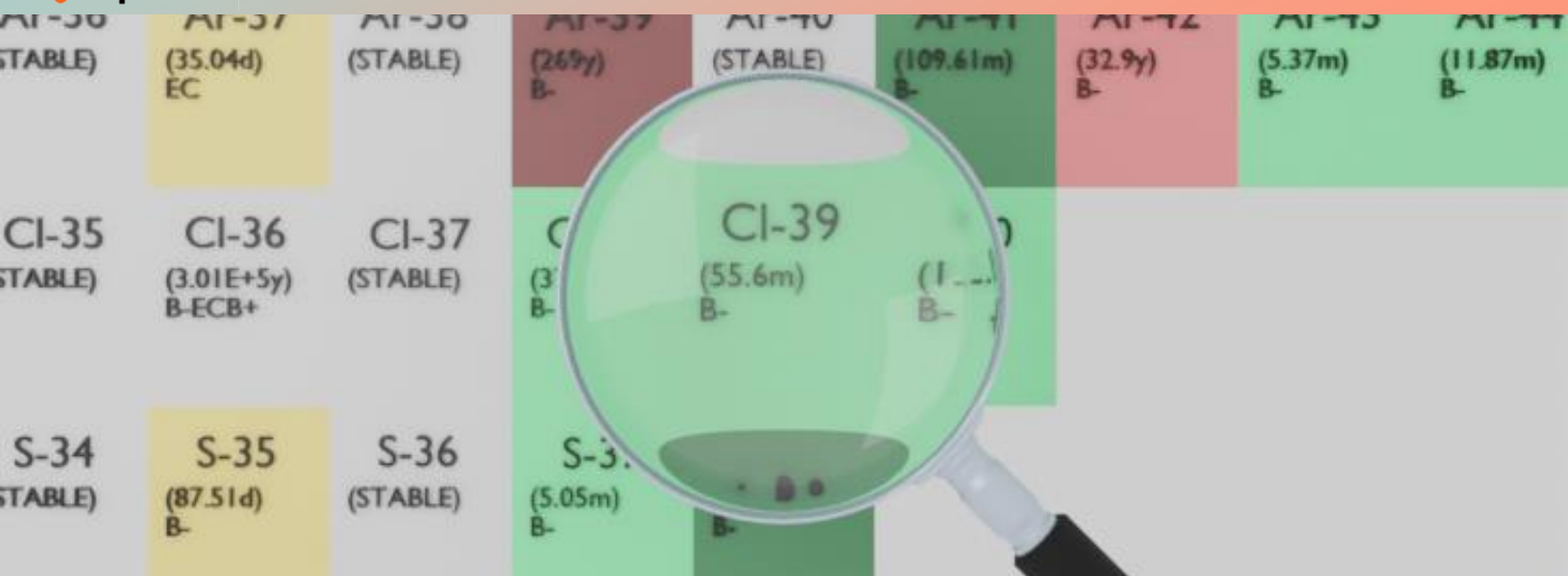




# CHLORINE-39

## SUMMARY DATA

### GENERAL

#### CLASSIFICATION

Isotope: Cl-39  
Atomic number (Z): 17  
Mass number (A): 39  
Neutron number (N): 22

#### RADIOACTIVE DECAY

Decay modes:  $\beta^-$   
Half-life: 55.6 [m]  
Decay constant:  $2.0778 \times 10^{-4}$  [1/s]  
Daughters: Ar-39 (100.0%)  
Radioactive daughters: Ar-39

#### DOSIMETRIC CONSTANTS

Mean alpha energy: 0.0 [MeV]  
Mean electron energy: 0.82463 [MeV]  
Mean photon energy: 1.45089 [MeV]  
Air kerma rate constant,  $\Gamma_{10}$ :  $4.868 \times 10^{-17}$  [Gy  $\cdot$  m<sup>2</sup>/Bq  $\cdot$  s]  
Air kerma coefficient,  $K_{\text{air}}$ :  $4.868 \times 10^{-17}$  [Gy  $\cdot$  m<sup>2</sup>/Bq  $\cdot$  s]  
Equilibrium dose constant for weakly-penetrating radiations ( $\alpha$  and/or electrons),  $\Delta_{\text{wp}}$ :  $1.321 \times 10^{-13}$  [Gy  $\cdot$  kg/Bq  $\cdot$  s]  
Equilibrium dose constant for alphas,  $\Delta_{\alpha}$ :  $0.000 \times 10^0$  [Gy  $\cdot$  kg/Bq  $\cdot$  s]

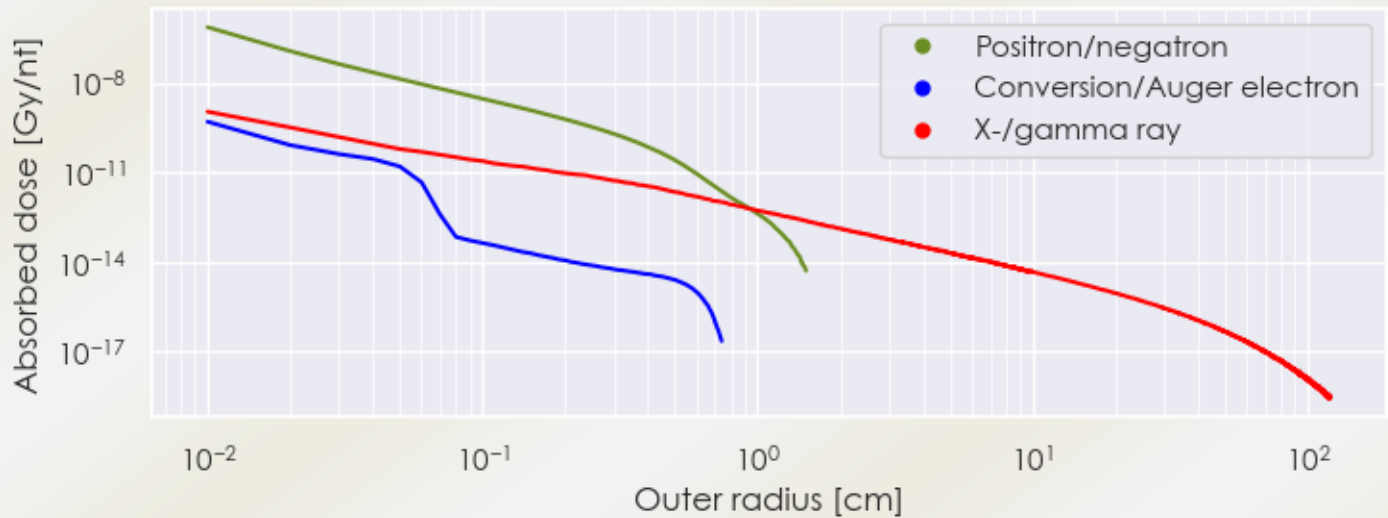
Equilibrium dose constant for betas/electrons,  $\Delta_{\beta, \beta+, e^-}$ :  $1.321 \times 10^{-13}$  [Gy·kg/Bq·s]

Equilibrium dose constant for photons,  $\Delta_p$ :  $2.325 \times 10^{-13}$  [Gy·kg/Bq·s]

## DOSE POINT KERNELS (PLOT)

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

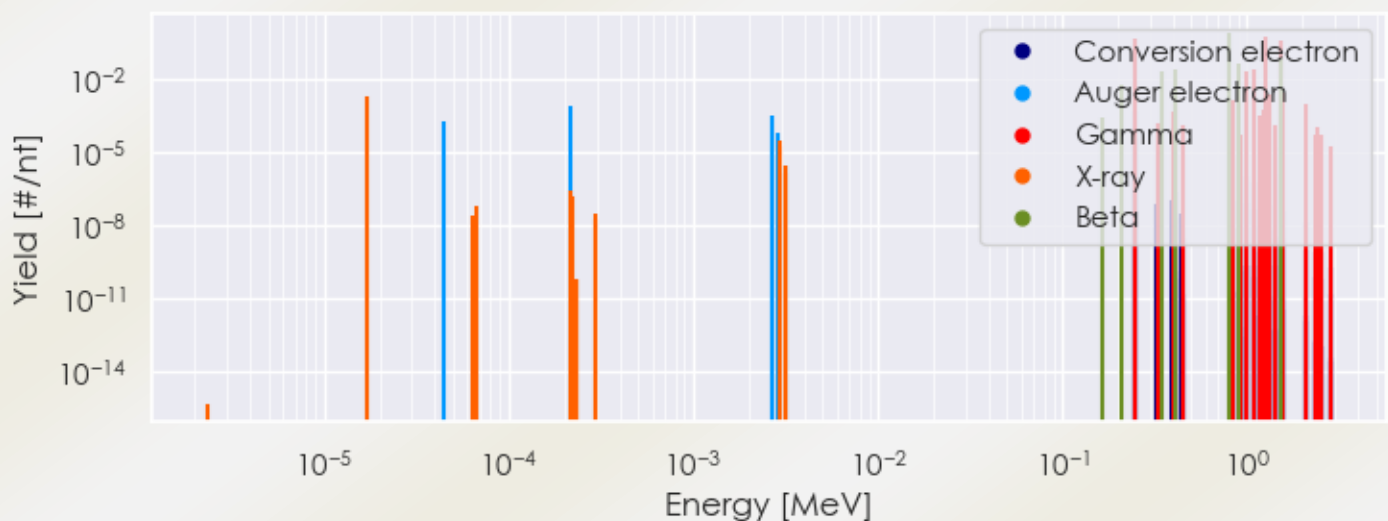
Note: Bins are spaced every 0.1 mm until a radius of 10 cm, and every 1 mm until a radius of 2 m.



Download tabulated dose point kernel file here: [www.mirdsoft.org/products/MIRDspecs/CI-39 DPK.csv](http://www.mirdsoft.org/products/MIRDspecs/CI-39 DPK.csv)

## SUMMARY SPECTRA (PLOT)

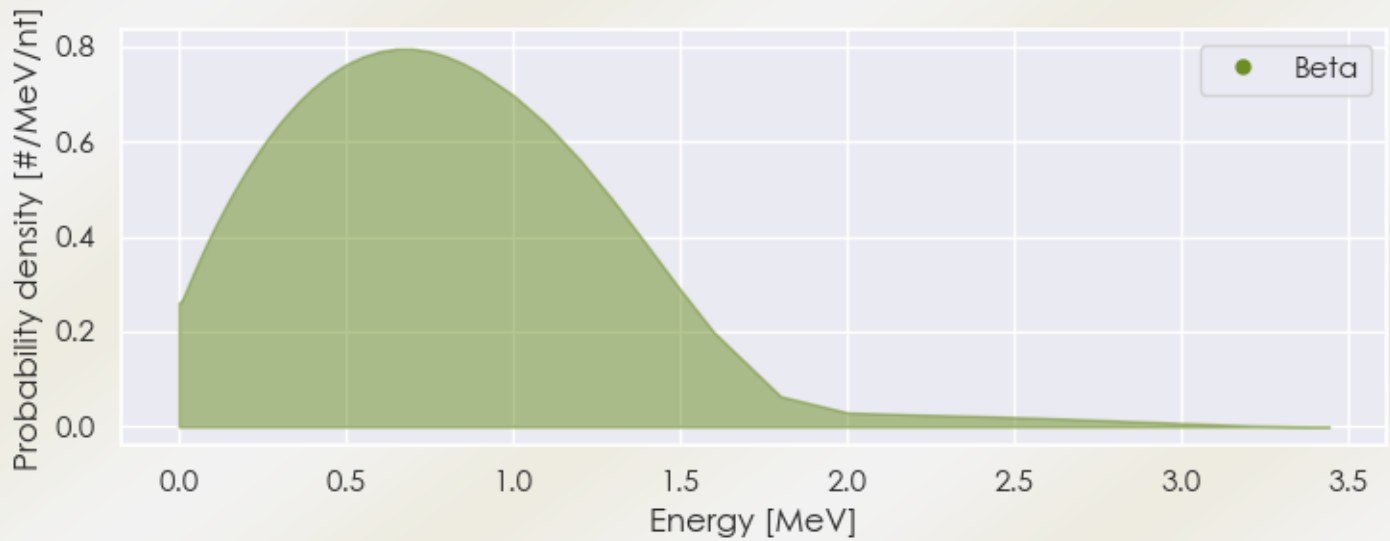
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: [www.mirdsoft.org/products/MIRDspecs/CI-39 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/CI-39 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/CI-39 Beta Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/CI-39 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/CI-39 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/CI-39 Summary Spectrum.csv)

| Energy [MeV] | Yield [# / nt] if > 0.01 | Radiation type |
|--------------|--------------------------|----------------|
| 2.50332e-01  | 4.626e-01                | Gamma          |
| 9.85864e-01  | 2.090e-02                | Gamma          |
| 1.09106e+00  | 2.417e-02                | Gamma          |
| 1.26719e+00  | 5.360e-01                | Gamma          |
| 1.51751e+00  | 3.924e-01                | Gamma          |
| 3.46877e-01  | 2.242e-02                | Beta           |
| 4.09442e-01  | 2.562e-02                | Beta           |
| 7.90718e-01  | 8.307e-01                | Beta           |
| 9.07967e-01  | 4.504e-02                | Beta           |
| 1.52973e+00  | 7.006e-02                | Beta           |

## 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)