



# OSMIUM-180

## SUMMARY DATA

### GENERAL

#### CLASSIFICATION

Isotope: Os-180  
Atomic number (Z): 76  
Mass number (A): 180  
Neutron number (N): 104

#### RADIOACTIVE DECAY

Decay modes:  $\beta^+$ , Electron capture  
Half-life: 21.5 [m]  
Decay constant:  $5.3732\text{e-}04$  [1/s]  
Daughters: Re-180 (100.0%)  
Radioactive daughters: Re-180

#### DOSIMETRIC CONSTANTS

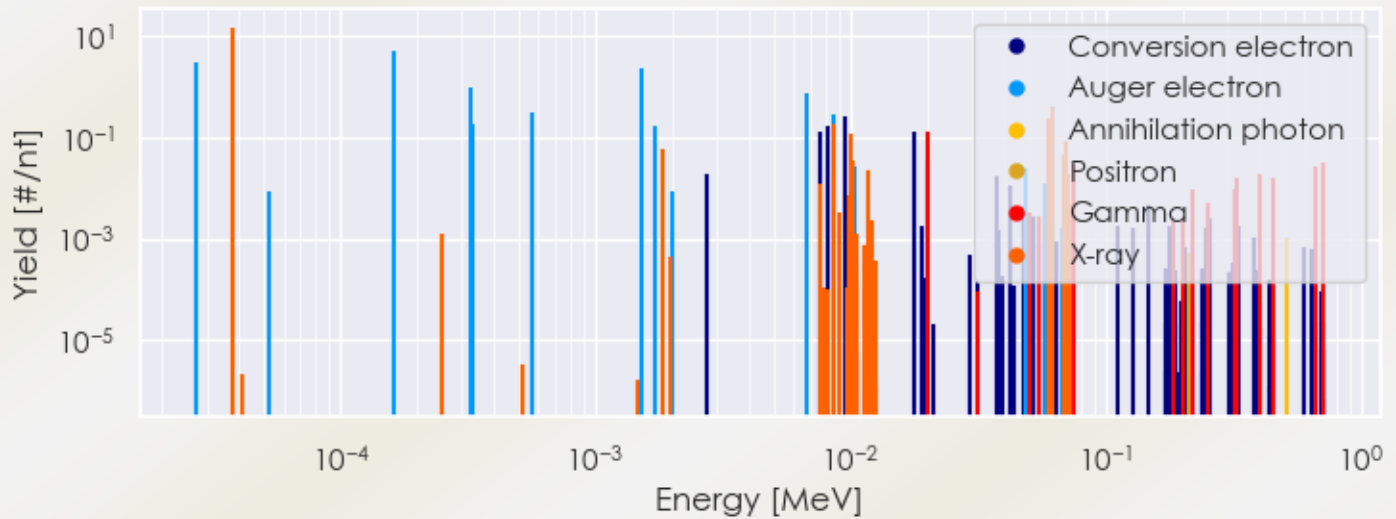
Mean alpha energy: 0.0 [MeV]  
Mean electron energy: 0.02984 [MeV]  
Mean photon energy: 0.12653 [MeV]  
Air kerma rate constant,  $\Gamma_{10}$ :  $1.705\text{e-}17$  [Gy  $\cdot$  m<sup>2</sup>/Bq  $\cdot$  s]  
Air kerma coefficient,  $K_{\text{air}}$ :  $1.707\text{e-}17$  [Gy  $\cdot$  m<sup>2</sup>/Bq  $\cdot$  s]  
Equilibrium dose constant for weakly-penetrating radiations ( $\alpha$  and/or electrons),  $\Delta_{\text{wp}}$ :  $4.781\text{e-}15$  [Gy  $\cdot$  kg/Bq  $\cdot$  s]  
Equilibrium dose constant for alphas,  $\Delta_{\alpha}$ :  $0.000\text{e+}00$  [Gy  $\cdot$  kg/Bq  $\cdot$  s]

Equilibrium dose constant for betas/electrons,  $\Delta_{\beta,\beta+,e-}$ : 4.781e-15 [Gy·kg/Bq·s]

Equilibrium dose constant for photons,  $\Delta_p$ : 2.027e-14 [Gy·kg/Bq·s]

### SUMMARY SPECTRA (PLOT)

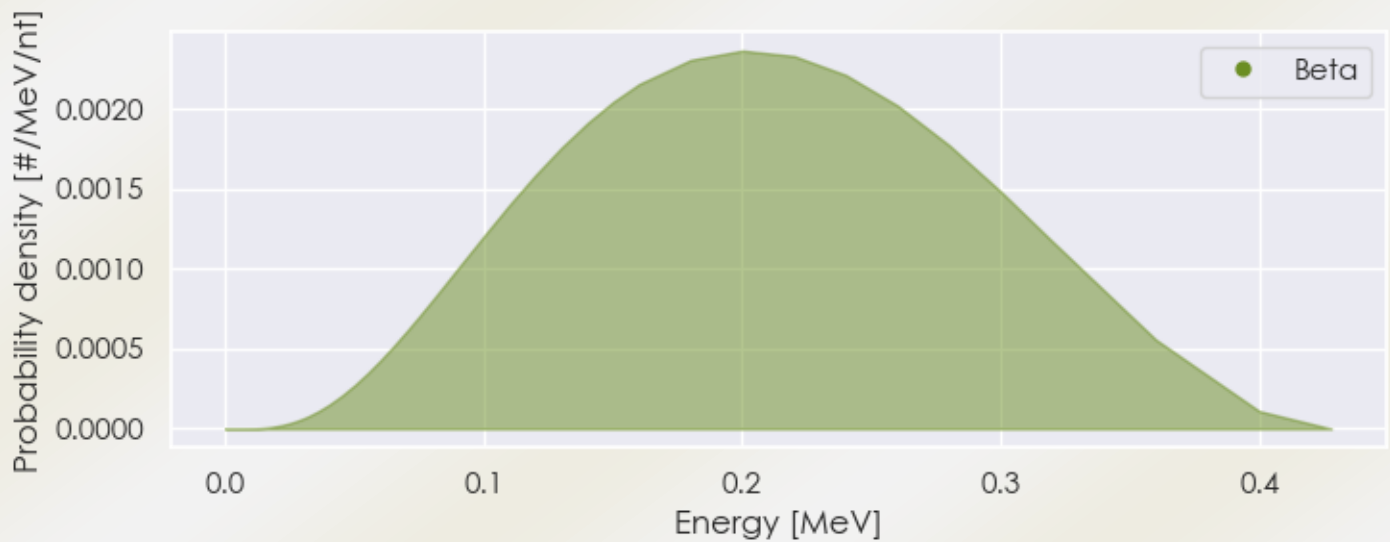
Spectra source: **ICRP Publication 107: Nuclear Decay Data for Dosimetric Calculations. Ann. ICRP 2008, 38 (3).**



Download tabulated summary spectra file here: [www.mirdsoft.org/products/MIRDspecs/Os-180 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Os-180%20Summary%20Spectrum.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/Os-180 Beta Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Os-180%20Beta%20Spectrum.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/Os-180 Summary Spectrum.csv](http://www.mirdsoft.org/products/MIRDspecs/Os-180%20Summary%20Spectrum.csv)

| Energy [MeV] | Yield [#/(nt)] if > 0.01 | Radiation type |
|--------------|--------------------------|----------------|
| 3.76228e-05  | 1.449e+01                | X-ray          |
| 1.84747e-03  | 5.844e-02                | X-ray          |
| 7.62640e-03  | 1.249e-02                | X-ray          |
| 8.57621e-03  | 2.135e-02                | X-ray          |
| 8.64531e-03  | 1.883e-01                | X-ray          |
| 1.00312e-02  | 1.155e-01                | X-ray          |
| 1.02735e-02  | 3.375e-02                | X-ray          |
| 1.17147e-02  | 2.176e-02                | X-ray          |
| 2.01000e-02  | 1.220e-01                | Gamma          |
| 5.98631e-02  | 2.352e-01                | X-ray          |
| 6.13181e-02  | 4.066e-01                | X-ray          |
| 6.91788e-02  | 4.394e-02                | X-ray          |
| 6.94956e-02  | 8.492e-02                | X-ray          |
| 7.13392e-02  | 1.006e-02                | X-ray          |
| 7.14134e-02  | 1.954e-02                | X-ray          |
| 7.46000e-02  | 2.947e-02                | Gamma          |
| 3.29000e-01  | 1.515e-02                | Gamma          |
| 4.01500e-01  | 1.800e-02                | Gamma          |
| 4.50400e-01  | 1.568e-02                | Gamma          |
| 6.67000e-01  | 2.602e-02                | Gamma          |
| 7.17400e-01  | 3.040e-02                | Gamma          |
| 2.73009e-05  | 2.849e+00                | Auger electron |
| 1.62317e-04  | 4.859e+00                | Auger electron |
| 3.25351e-04  | 9.482e-01                | Auger electron |
| 3.29366e-04  | 1.809e-01                | Auger electron |
| 5.60250e-04  | 3.099e-01                | Auger electron |
| 1.52501e-03  | 2.306e+00                | Auger electron |
| 1.71416e-03  | 1.633e-01                | Auger electron |

|                    |           |                     |
|--------------------|-----------|---------------------|
| <b>2.74400e-03</b> | 1.914e-02 | Conversion electron |
| <b>6.68678e-03</b> | 7.052e-01 | Auger electron      |
| <b>7.59200e-03</b> | 1.317e-01 | Conversion electron |
| <b>8.10700e-03</b> | 1.707e-01 | Conversion electron |
| <b>8.51309e-03</b> | 2.750e-01 | Auger electron      |
| <b>9.56200e-03</b> | 2.486e-01 | Conversion electron |
| <b>1.03691e-02</b> | 2.661e-02 | Auger electron      |
| <b>1.77395e-02</b> | 1.328e-01 | Conversion electron |
| <b>2.01000e-02</b> | 3.571e-02 | Conversion electron |
| <b>3.72920e-02</b> | 1.654e-02 | Conversion electron |
| <b>4.18920e-02</b> | 1.094e-02 | Conversion electron |
| <b>4.85493e-02</b> | 2.392e-02 | Auger electron      |
| <b>5.80540e-02</b> | 1.260e-02 | 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/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)