



## Periodic Table of Elements

### Element Erbium - Er

Comprehensive data on the chemical element Erbium is provided on this page; including scores of properties, element names in many languages, most known nuclides of Erbium. Common chemical compounds are also provided for many elements. In addition technical terms are linked to their definitions and the menu contains links to related articles that are a great aid in one's studies.

#### Erbium Menu

##### Overview of Erbium

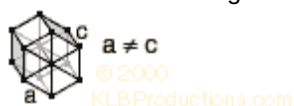
- **Atomic Number:** 68
- **Period:** 6
- **Series:** Lanthanides

##### Erbium's Name in Other Languages

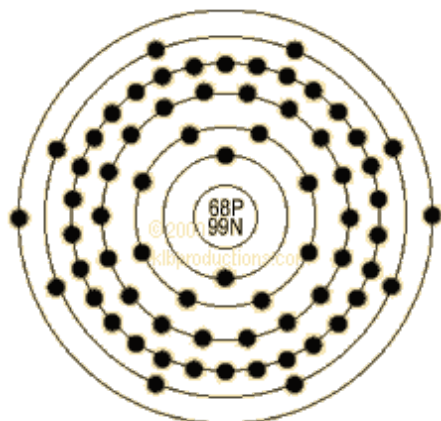
- **Latin:** Erbium
- **Czech:** Erbium
- **Croatian:** Erbij
- **French:** Erbium
- **German:** Erbium - s
- **Italian:** Erbio
- **Norwegian:** Erbium
- **Portuguese:** érbio
- **Russian:** Эрбий
- **Spanish:** érbio
- **Swedish:** Erbium

##### Atomic Structure of Erbium

- **Atomic Radius:** 2.45Å
- **Atomic Volume:** 18.4cm<sup>3</sup>/mol
- **Covalent Radius:** 1.57Å
- **Cross Section** (Thermal Neutron Capture) $\sigma_a$ /barns: 160
- **Crystal Structure:** Hexagonal



- **Electron Configuration:**  
 $1s^2 2s^2 p^6 3s^2 p^6 d^{10} 4s^2 p^6 d^{10} f^{12} 5s^2 p^6 6s^2$
  - **Electrons per Energy Level:** 2,8,18,30,8,2
- Shell Model**



- **Ionic Radius:** 0.881Å
- **Filling Orbital:** 4f<sup>12</sup>
- **Number of Electrons (with no charge):** 68
- **Number of Neutrons (most common/stable nuclide):** 99
- **Number of Protons:** 68

- **Oxidation States:** 3
- **Valence Electrons:**  $4f^{12} 6s^2$

#### Chemical Properties of Erbium

- **Electrochemical Equivalent:** 2.0802g/amp-hr
- **Electron Work Function:**
- **Electronegativity:** 1.24 (Pauling); 1.14 (Allrod Rochow)
- **Heat of Fusion:** 19.9kJ/mol
- **Incompatibilities:**
- **Ionization Potential**
  - **First:** 6.101
  - **Second:** 11.929
  - **Third:** 22.739
- **Valence Electron Potential (-eV):** 49

#### Physical Properties of Erbium

- **Atomic Mass Average:** 167.26
- **Boiling Point:** 3136K 2863°C 5185°F
- **Coefficient of lineal thermal expansion/K<sup>-1</sup>:**  $9.2E^{-6}$
- **Conductivity**
  - Electrical:**  $0.0117 \cdot 10^6/\text{cm } \Omega$
  - Thermal:** 0.143 W/cmK
- **Density:** 9.07g/cc @ 300K
- **Description:**

A grayish-silver rare earth metal that slowly tarnishes in air.
- **Elastic Modulus:**
  - **Bulk:** 44.4/GPa
  - **Rigidity:** 28.3/GPa
  - **Youngs:** 69.9/GPa
- **Enthalpy of Atomization:** 314 kJ/mole @ 25°C
- **Enthalpy of Fusion:** 17.2 kJ/mole
- **Enthalpy of Vaporization:** 261 kJ/mole
- **Flammability Class:**
- **Freezing Point:** *see melting point*
- **Hardness Scale**
  - **Brinell:** 814 MN m<sup>-2</sup>
  - **Vickers:** 589 MN m<sup>-2</sup>
- **Heat of Vaporization:** 261kJ/mol
- **Melting Point:** 1795K 1522°C 2772°F
- **Molar Volume:** 18.45 cm<sup>3</sup>/mole
- **Physical State (at 20°C & 1atm):** Solid
- **Specific Heat:** 0.17J/gK

#### Regulatory / Health

- **CAS Number**
  - 7440-52-0
- **OSHA Permissible Exposure Limit (PEL)**
  - No limits set by OSHA
- **OSHA PEL Vacated 1989**
  - No limits set by OSHA
- **NIOSH Recommended Exposure Limit (REL)**
  - No limits set by NIOSH
- **Levels In Humans:**

Note: this data represents naturally occurring levels of elements in the typical human, it DOES NOT represent recommended daily allowances.

  - **Blood/mg dm<sup>-3</sup>:** n/a
  - **Bone/p.p.m:** n/a
  - **Liver/p.p.m:** n/a
  - **Muscle/p.p.m:** n/a



- **Daily Dietary Intake:** n/a
- **Total Mass In Avg. 70kg human:** n/a
- **Discovery Year:** 1842
- **Name Origin:**
  - From Ytterby, Sweden.
- **Abundance of Erbium:**
  - **Earth's Crust/p.p.m.:** 3.8
  - **Seawater/p.p.m.:**
    - Atlantic Surface: 5.9E-07
    - Atlantic Deep: 8.6E-07
    - Pacific Surface: N/A
    - Pacific Deep: N/A
  - **Atmosphere/p.p.m.:** N/A
  - **Sun (Relative to H=1E<sup>12</sup>):** 5.8
- **Sources of Erbium:**
  - Found with other heavier rare earths. Around 500 tons are produced world wide annually. Primary mining areas are USA, Brazil, India, Sri Lanka and Australia.
- **Uses of Erbium:**
  - Erbium oxide is used in ceramics to obtain a pink glaze. Also used to make infrared-absorbing glass and in alloys with titanium.
- **Additional Notes:**

## Erbium Menu

## References

A list of reference sources used to compile the data provided on our periodic table of elements can be found on the main periodic table page.

## Citing this page

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<https://EnvironmentalChemistry.com/yogi/periodic/Er.html>

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