Erbium Encyclopedia Article

Erbium

The following sections of this BookRags Literature Study Guide is offprint from Gale's For Students Series: Presenting Analysis, Context, and Criticism on Commonly Studied Works: Introduction, Author Biography, Plot Summary, Characters, Themes, Style, Historical Context, Critical Overview, Criticism and Critical Essays, Media Adaptations, Topics for Further Study, Compare & Contrast, What Do I Read Next?, For Further Study, and Sources.

(c)1998-2002; (c)2002 by Gale. Gale is an imprint of The Gale Group, Inc., a division of Thomson Learning, Inc. Gale and Design and Thomson Learning are trademarks used herein under license.

The following sections, if they exist, are offprint from Beacham's Encyclopedia of Popular Fiction: "Social Concerns", "Thematic Overview", "Techniques", "Literary Precedents", "Key Questions", "Related Titles", "Adaptations", "Related Web Sites". (c)1994-2005, by Walton Beacham.

The following sections, if they exist, are offprint from Beacham's Guide to Literature for Young Adults: "About the Author", "Overview", "Setting", "Literary Qualities", "Social Sensitivity", "Topics for Discussion", "Ideas for Reports and Papers". (c)1994-2005, by Walton Beacham.

All other sections in this Literature Study Guide are owned and copyrighted by BookRags, Inc.

Contents

Erbium Encyclopedia Article.....1

Contents.....2

Erbium.....3

Erbium

Erbium is one of the **rare earth elements** found in Row 6 of the **periodic table**. The elements in this family are also known as the lanthanides, after the first member of the family. Erbium's **atomic number** is 68, its atomic **mass** is 167.26, and its chemical symbol is Er.

Properties

Erbium is a typical metal with a bright, shiny surface. It is soft and malleable with a melting point of 2,772°F (1,522°C), a **boiling point** of about 4,500°F (about 2,500°C), and a **density** of 9.16 grams per cubic centimeter. Erbium tends to be moderately active, and does not react with **oxygen** as quickly as do most other lanthanides. Erbium compounds tend to be pink or red, making them useful for coloring **glass** and **ceramics**.

Occurrence and Extraction

The term rare earth elements is somewhat inappropriate as the elements in this family are not really very rare. The term actually refers to the difficulty in separating the elements from each other because of their chemical similarity. Erbium ranks about number 42 in abundance in the Earth's crust, making it more common than **bromine**, **uranium**, **tin**, **silver**, **mercury**, and other better-known elements. It is extracted from its ores by first being converted to erbium fluoride (EbF_3), which is then electrolyzed to obtain the pure metal: $2ErF_3$ 2Er + $3F_2$.

Discovery and Naming

Erbium was discovered in 1843 by the Swedish chemist Carl Gustav Mosander. Mosander spent many years analyzing an unusual new mineral that had been discovered in 1787 by the Swedish army office Carl Axel Arrhenius (1757-1824). That mineral, called yttria, was later to yield a total of nine new elements. Mosander suggested the name erbium for the element in honor of the town near which the mineral was discovered, Ytterby. Three other elements were also named after this small town: **terbium**, **yttrium**, and **ytterbium**.

Uses

The most important uses of erbium are in **lasers** and optical fibers. Erbium lasers are now being used to treat skin problems, such as removing wrinkles and scars. They work well for this purpose because the light they produce has relatively little **energy** and does not penetrate the skin very deeply. They also produce relatively little **heat** and cause few side effects. Erbium optical fibers are being used in long distance communication

systems and in military applications. There are no commercially important erbium compounds.