

Samarium Encyclopedia Article

Samarium

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

Samarium Encyclopedia Article.....	1
Contents.....	2
Samarium.....	3

Samarium

Samarium is a rare earth element, one of the elements that occupy the space in Row 6 of the **periodic table** between **lanthanum** (atomic number 57) and **hafnium** (atomic number 72). Samarium's **atomic number** is 62, its atomic **mass** is 150.4, and its chemical symbol is Sm.

Properties

Samarium is a yellowish metal with a melting point of 1,962°F (1,072°C), a **boiling point** of 3,450°F (1,900°C), and a **density** of 7.53 grams per cubic centimeter. It is the hardest and most brittle of the **rare earth elements**.

Samarium is a fairly reactive metal that reacts with **water**, **oxygen**, acids, the **halogens**, and some other elements. It ignites in pure oxygen at a **temperature** of about 300°F (150°C).

Occurrence and Extraction

Samarium is a moderately abundant element. It is estimated to occur at about 4.5-7 parts per million in the Earth's crust. It is found in the minerals samarskite, cerite, orthite, ytterbite, and fluorspar. It can be produced by heating samarium **oxide** (Sm_2O_3) with **barium** or lanthanum metal: $2\text{Ba} + \text{Sm}_2\text{O}_3 \rightarrow \text{Ba}_2\text{O}_3 + 2\text{Sm}$.

Discovery and Naming

Samarium was one of seven new elements found in an unusual mineral originally discovered near the town of Bastnas, Sweden, in the 1830s. The new element was "discovered" at least three times in the period 1879-80 by the French chemists Jean-Charles Galissard de Marignac (1817-1894), Paul-Émile Lecoq de Boisbaudran, and Eugène-Anatole Demarçay (1852-1904), all working independently. Credit for the discovery of samarium is often given to all three men. The element's name was taken from a mineral in which it occurs, samarskite which, in turn, was named after a Russian mine official, Colonel Samarski.

Uses

Like other rare earth elements, samarium is used to add **color** or special optical properties to **glass**. It is also used to make **lasers** and very strong electromagnets. One of the strongest magnets available is made from an **alloy** of samarium and **cobalt**. Samarium-cobalt (SmCo) magnets retain their magnetic properties at high temperatures and are not very reactive. They are used in certain types of airplane motors.