Smelting Encyclopedia Article

Smelting

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

Smelting Encyclopedia Article.....1

Contents.....2

Smelting.....3

Smelting

Reductive **calcination**, or smelting, is a process of heating ores to a high temperatures in the presence of a reducing agent such as **carbon** (coke), and a fluxing agent to remove the accompanying clay and sand (gangue). Smelting, which involves the **reduction** of metal oxides in ores to pure metal, is followed by separation of the gangue of the liquid metal and slag (i.e., the fused mixture of impurities and flux).

Iron ore is the ore most frequently smelted. The ore, typically containing 20% clay and sand, is first heated in an air blast furnace with coke and limestone (the fluxing agent) to a **temperature** above the melting point of iron and the slag. The coke is oxidized to **carbon dioxide**, which changes to **carbon monoxide** at high temperatures. The carbon monoxide reduces the ores, i.e., converts the metal oxides to metal, by taking on **oxygen**, which changes the carbon monoxide back to carbon dioxide. The difference in densities of the molten iron and molten slag allow each material to be removed separately from the furnace.

Secondary smelting is a related process used to recover nonferrous **metals** and alloys from new and used scrap and dross. Examples of materials that may be subjected to secondary smelting include scrap **aluminum**, babbitt, brass, bronze, **copper**, **iridium**, **lead**, **magnesium**, **nickel**, platinum-group metals, **precious metals**, **tin**, and **zinc**.