

Cast Irons Containing Rare Earths

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Written by Sheng Da, 384 pages, published by Tsinghua University Press, China. ISBN7-302-03918-6, published in the year 2000.

China has the richest resources of rare earth elements; these include the lanthanides (lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium), scandium and yttrium. The elements occur as a byproduct of the mining and extraction of iron; the slag that remains after steel is produced is extremely rich in the rare earths. The Chinese rare earths also have a lower radioactive element content.

The biggest technological application of rare earths is in the modification of cast iron to produce spheroidal or vermicular graphite. Given all this, it is not surprising that this book has emerged from China, where a great deal of research is conducted on the application of these elements.

There are many quantitative data tabulated with references provided should it be necessary to check sources. The majority of the book is concerned with the production of cast irons; in that sense the contents are technological with a smaller focus on science and mechanisms. For example, the mechanism by which the inoculation of cast iron produces the required form of graphite is not explained, nor is there an introduction to cast iron. The book is therefore of greatest use to experienced metallurgists as a reference text.