BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Alloy 800

Author W. Betteridge, R. Krefeld, H. Kröckel, S. J. Lloyd, M. Van de Voorde, and C. Vivante

Publisher North Holland Publishing Company (1978)

Pages 478

Price $61.00

Reviewer O. Norman Carlson

Alloy 800 is the Proceedings of the Petten International Conference held at the JRC Petten Establishment in The Netherlands in 1978. This was the second international conference on this versatile alloy, which attests to its commercial importance and unique properties. Alloy 800 is the generic term for a class of alloys based on Incoloy 800, which was developed in 1949 by the International Nickel Company for use as a heater element sheathing for radiant heating elements in electrical appliances. It is an iron-base alloy containing 30 to 35% nickel, 19 to 23% chromium, and lesser but varying amounts of titanium, aluminum, and carbon. The alloy's remarkable properties have led to its use over a wide range of temperatures for a number of important applications. In the low temperature range, up to 350°C, it is being used in light water reactors and steam cycle electricity generation; in the intermediate range, 350 to 600°C, in fast reactors; and at high temperatures, above 600°C, in the process-heat high temperature reactors (HTRs), petrochemical processing, coal gasification, and fossil fuel combustion.

The format of the conference consisted of review papers on the different properties or applications of Alloy 800 followed by short research papers. The review papers in particular are complete and thoughtful presentations and are of uniformly high quality. The individual research papers vary considerably both in quality and value perhaps in part because of their brevity resulting from an apparent page limitation. The opening and closing remarks of the conference chairman provide an excellent introduction and summary for the book. It is enlivened by the questions and comments of the conference audience and the author's reply with several constructive suggestions or criticisms coming out of these discussions.

The sections on the high temperature corrosion and mechanical performance in various environments are unquestionably the highlights of the book. Included are outstanding papers on the effects of chemical process gases, water and steam, liquid sodium, and HTR helium by leading authorities in the field. Certainly in this area, at least, the book will serve as an important reference source for the metallurgical and nuclear engineering communities.

Judging from the list of authors and participants at the conference, this was predominantly a European affair although the presence of North American scientists is evident notably in the mechanical properties and chemical process areas. This may tell us something about where the major research emphasis and support for work on this important alloy currently lie.

O. N. Carlson is professor of materials science and engineering at Iowa State University and senior metallurgist with the Ames Laboratory, U.S. Department of Energy. His research interests include phase equilibria, metal preparation and purification, mass transport in solids, and effects of solutes on the mechanical properties of refractory metals. He is coauthor of Thorium: Preparation and Properties *as well as numerous technical papers and chapters of books.*

The Energy Center: New Alternative for Effective Energy Use

Author John F. Hemdal

Publisher Ann Arbor Science Publishers, Inc. (1979)

Pages 272

Price $37.50

Reviewer W. M. Beasley