



High Temperature Oxidation and Corrosion of Metals, Volume 1, Second Edition (Corrosion Series)

By David John Young

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High Temperature Oxidation and Corrosion of Metals, Volume 1, Second Edition (Corrosion Series) By David John Young

High Temperature Oxidation and Corrosion of Metals, Second Edition, provides a high level understanding of the fundamental mechanisms of high temperature alloy oxidation. It uses this understanding to develop methods of predicting oxidation rates and the way they change with temperature, gas chemistry, and alloy composition.

The book focuses on the design and selection of alloy compositions which provide optimal resistance to attack by corrosive gases, providing a rigorous treatment of the thermodynamics and kinetics underlying high temperature alloy corrosion.

In addition, it emphasizes quantitative calculations for predicting reaction rates and the effects of temperature, oxidant activities, and alloy compositions. Users will find this book to be an indispensable source of information for researchers and students who are dealing with high temperature corrosion.

- Emphasizes quantitative calculations for predicting reaction rates and the effects of temperature, oxidant activities, and alloy compositions
- Uses phase diagrams and diffusion paths to analyze and interpret scale structures and internal precipitation distributions
- Presents a detailed examination of corrosion in industrial gases (water vapor effects, carburization and metal dusting, sulphidation)
- Contains numerous micrographs, phase diagrams, and tabulations of relevant thermodynamic and kinetic data
- Combines physical chemistry and materials science methodologies
- Provides two completely new chapters (chapters 11 and 13), and numerous other updates throughout the text

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Editorial Review

From the Back Cover

High Temperature Oxidation and Corrosion of Metals, 2e is concerned with understanding the fundamental mechanisms of high temperature alloy oxidation. It uses this understanding to develop methods of predicting oxidation rates and the way they change with temperature, gas chemistry and alloy composition. The focus is on designing (or selecting) alloy compositions which provide optimal resistance to attack by corrosive gases. The book provides a rigorous treatment of the thermodynamics and kinetics underlying high temperature alloy corrosion. It emphasizes quantitative calculations for predicting reaction rates and the effects of temperature, oxidant activities and alloy compositions. An indispensable source of information for researchers and students who are dealing with high temperature corrosion.

- Emphasises quantitative calculations for predicting reaction rates and the effects of temperature, oxidant activities and alloy compositions.
- Uses phase diagrams and diffusion paths to analyse and interpret scale structures and internal precipitation distributions
- Provides a detailed examination of corrosion in industrial gases (water vapour effects, carburisation and metal dusting, sulphidation)
- Text well supported by numerous micrographs, phase diagrams and tabulations of relevant thermodynamic and kinetic data
- Combines physical chemistry and materials science methodologies
- Contains two completely new chapters (chapters 11 and 13) and numerous updates throughout the text

About the Author

David Young was educated at the University of Melbourne then worked in Canada for 9 years (University of Toronto, McMaster University, National Research Council of Canada) on high temperature metal-gas reactions. Returning to Australia, he worked for BHP Steel Research then joined the University of New South Wales. There he led the School of Materials Science & Engineering for 15 years, and has carried out extensive work on high temperature corrosion in mixed gas atmospheres.

His work has led to over 350 publications, including the books *Diffusion in the Condensed State* (with J.S. Kirkaldy), Institute of Metals (1988) and *High Temperature Oxidation and Corrosion of Metals*, 1st ed., Elsevier (2008). It has been recognized by his election to the Australian Academy of Technological Sciences and Engineering, the U. R. Evans Award, Institute of Corrosion Science & Technology, UK, the High Temperature Materials Outstanding Achievement Award, Electrochemical Society, USA and election as Fellow, Electrochemical Society.

Users Review

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