

Table of Contents

Preface

Introduction. Acknowledgement

Chapter 1: Thermodynamic Aspects of High Temperature Corrosion

1. Thermodynamics of Mixtures

P. Sarrazin, A. Galerie and J. Fouletier 1

2. Gas-Solid Equilibrium

P. Sarrazin, A. Galerie and J. Fouletier 7

Chapter 2: High Temperature Corrosion : Experimental

1. The Practical Importance of High Temperature Corrosion

P. Sarrazin, A. Galerie and J. Fouletier 35

2. Experimental Techniques

P. Sarrazin, A. Galerie and J. Fouletier 36

3. Phenomenological Laws

P. Sarrazin, A. Galerie and J. Fouletier 69

Chapter 3: Scale Structures

1. Introduction

P. Sarrazin, A. Galerie and J. Fouletier 77

2. Defects Responsible for the Growth of Compact Scales

P. Sarrazin, A. Galerie and J. Fouletier 78

3. Defects Responsible for the Growth of Porous Scales

P. Sarrazin, A. Galerie and J. Fouletier 107

Chapter 4: Kinetic Approach to High Temperature Corrosion: Growth of a Compact Scale

1. Introduction

P. Sarrazin, A. Galerie and J. Fouletier 117

2. Formulation of the Elementary Processes

P. Sarrazin, A. Galerie and J. Fouletier 118

3. Calculation of the Reaction Rate of the Elementary Processes

P. Sarrazin, A. Galerie and J. Fouletier 128

4. General System of Equations

P. Sarrazin, A. Galerie and J. Fouletier 132

5. Overall Reaction Rate Limited by one of the Elementary Chemical Processes

P. Sarrazin, A. Galerie and J. Fouletier 137

6. Reaction Rate in Mixed Regimes

P. Sarrazin, A. Galerie and J. Fouletier 180

Chapter 5: Kinetic Aspects of High Temperature Corrosion: Formation of Multilayered Scales

1. Introduction

P. Sarrazin, A. Galerie and J. Fouletier 193

2. Formation of Compact Subscales

P. Sarrazin, A. Galerie and J. Fouletier 194

3. Formation of Porous and Partially Porous Scales

P. Sarrazin, A. Galerie and J. Fouletier 205

Chapter 6: Corrosion Protection

1. Atmosphere Control	
P. Sarrazin, A. Galerie and J. Fouletier	213
2. Use of Alloys	
P. Sarrazin, A. Galerie and J. Fouletier	215
3. Protection by Coatings	
P. Sarrazin, A. Galerie and J. Fouletier	233

Chapter 7: Case Studies and Worked Examples

1. Stoichiometry and Electrical Conductivity of NiO	
P. Sarrazin, A. Galerie and J. Fouletier	251
2. Stoichiometry of Nb₂O₅	
P. Sarrazin, A. Galerie and J. Fouletier	258
3. Phase Equilibria in the System Ni-S-O at 900 K	
P. Sarrazin, A. Galerie and J. Fouletier	263
4. Manganese Sulphide (MnS) Properties - Manganese Sulphidation	
P. Sarrazin, A. Galerie and J. Fouletier	271
5. Properties of Cobalt Oxide (CoC) - Oxidation of Cobalt	
P. Sarrazin, A. Galerie and J. Fouletier	281
6. Properties of Copper (I) Oxide Cu₂O - Oxidation of Copper	
P. Sarrazin, A. Galerie and J. Fouletier	292
7. Niobium Oxidation in Oxygen or Water Vapour	
P. Sarrazin, A. Galerie and J. Fouletier	299
8. Lead Chlorination	
P. Sarrazin, A. Galerie and J. Fouletier	310
9. Oxidation of Zircaloy 4	
P. Sarrazin, A. Galerie and J. Fouletier	316

Bibliography OF BASIC BOOKS

Index