

1. Record Nr.	UNINA9910830746703321
Titolo	Green corrosion chemistry and engineering [[electronic resource]] : opportunities and challenges / / edited by Sanjay K. Sharma
Pubbl/distr/stampa	Weinheim, : Wiley-VCH Chichester, : John Wiley [distributor], 2012
ISBN	3-527-64179-3 1-283-51406-0 9786613826510 3-527-64178-5 3-527-64180-7
Descrizione fisica	1 online resource (431 p.)
Altri autori (Persone)	SharmaSanjay Kumar
Disciplina	620.11223
Soggetti	Corrosion and anti-corrosives Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"With a foreword by Nabuk Okon Eddy".
Nota di contenuto	Green Corrosion Chemistry and Engineering; 1.5 Corrosion Rust; Contents; Foreword; Preface; Acknowledgments; About The Editor; List of Contributors; 1 Basics of Corrosion Chemistry; 1.1 Introduction; 1.2 Metallic Corrosion; 1.2.1 Basic Processes; 1.2.2 Potential-pH Diagram; 1.2.3 Corrosion Potential; 1.2.4 Anodic Metal Dissolution; 1.2.5 Cathodic Oxidant Reduction; 1.3 Metallic Passivity; 1.3.1 Passivity of Metals; 1.3.2 Passivation of Metals; 1.3.3 Passive Films; 1.3.4 Chloride-Breakdown of Passive Films; 1.4 Localized Corrosion; 1.4.1 Pitting Corrosion; 1.4.2 Crevice Corrosion 1.4.3 Potential-Dimension Diagram 1.5.1 Rust in Corrosion; 1.5.2 Ion-Selective Rust; 1.5.3 Electron-Selective Rust; 1.5.4 Redox Rust; 1.6 Atmospheric Corrosion; 1.6.1 Atmospheric Corrosion Chemistry; 1.6.2 Weathering Steel Corrosion; 1.6.3 Anticorrosion Rust; 1.7 Concluding Remarks; References; 2 Corrosion and Electrochemistry; 2.1 Introduction; 2.2 Thermodynamics and the Stability of Metals; 2.3 Free Energy and Electrode Potential; 2.4 Electrode Potential Measurements; 2.5 Equilibrium Electrode Potentials; 2.6 Use of Pourbaix Diagrams; 2.7

## Dynamic Electrochemical Processes

2.8 Concentration PolarizationReferences; Further Reading; 3 Application of Microelectrochemical Techniques in Corrosion Research; 3.1 Introduction; 3.2 Scanning Vibrating Electrode Technique; 3.2.1 The Technique and Principle; 3.2.2 Local Dissolution Behavior of the Welding Zone of Pipeline Steel; 3.2.3 Effects of Mill Scale and Corrosion Product Deposit on Corrosion of the Steel; 3.3 Localized Electrochemical Impedance Spectroscopy; 3.3.1 The Technique and Principle; 3.3.2 Corrosion of Steel at the Base of the Coating Defect 3.3.3 Microscopic Metallurgical Electrochemistry of Pipeline Steels3.3.4 Characterization of Local Electrochemical Activity of a Precracked Steel Specimen; 3.4 Scanning Kelvin Probe; 3.4.1 The Technique and Principle; 3.4.2 Monitoring the Coating Disbondment; 3.5 Conclusive Remarks; Acknowledgments; References; 4 Protective Coatings: an Overview; 4.1 Introduction; 4.2 Selection of Paint Coatings; 4.3 Classification of Various Coatings; 4.4 Chemistry of Resins; 4.4.1 Alkyd Resins; 4.4.2 Modified Alkyds; 4.4.3 Epoxies; 4.4.4 Urethanes; 4.4.5 Isocyanates; 4.4.6 Aliphatic Isocyanates 4.4.7 Polyols4.4.8 Acrylic Urethanes; 4.4.9 Moisture-Cured Polyurethanes; 4.4.10 Zinc-Based Coatings; 4.5 High-Performance Coatings; 4.5.1 The 100% Solventless Epoxies; 4.5.2 Concept of Underwater Coatings; 4.5.3 Polyvinylidenedifluride Coatings; 4.5.4 Polysiloxane Coatings; 4.5.5 Fire-Resistant Coatings; 4.5.6 Organic-Inorganic Hybrid (OIH) Waterborne Coatings; 4.6 Surface Preparation; 4.7 Paint Application; 4.8 Importance of Supervision, Inspection, and Quality Control during Paint Coatings; 4.9 Training and Certification Courses; 4.10 Summary; References  
5 New Era of Eco-Friendly Corrosion Inhibitors

---

### Sommario/riassunto

With its unique focus on specifically addressing the problems for societies and economies associated with corrosion and their solution, this book provides an up-to-date overview of the progress in corrosion chemistry and engineering. International experts actively involved in research and development place particular emphasis on how to counter the economic and environmental consequences of corrosion with the help of science and technology, making this a valuable resource for researchers as well as decision makers in industry and politics. Further major parts of the book are devoted to corrosio

---