

1. Record Nr.	UNINA9910877082503321
Autore	Zito Ralph
Titolo	Electrochemical water processing // Ralph Zito
Pubbl/distr/stampa	Hoboken, N.J., : Wiley Salem, Mass., : Scrivener, c2011
ISBN	1-283-20405-3 9786613204059 1-61344-913-5 1-118-10467-6 1-118-10470-6
Descrizione fisica	1 online resource (338 p.)
Disciplina	628.1/62
Soggetti	Water - Purification Electrochemistry, Industrial
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Electrochemical Water Processing; Contents; Preface; Acknowledgements; Introduction; 1. Water Contaminants and Their Removal; 1.1 Introduction; 1.2 Technology, History, and Background; 1.3 Application Areas: Electrochemical Technology Water Processing; 2. Basic Electrochemical and Physical Principles; 2.1 Introduction; 2.2 Acidity and Alkalinity, pH; 2.3 Activity and Activity Coefficients; 2.4 Equilibrium and Dissociation Constants; 2.4.1 Degree or Percentage Dissociation; 2.5 Electrode, or Half Cell Potential; 2.6 Chemical Potential Definition; 2.7 Concentration Potential 2.8 Equivalent Conductance2.9 Free Energy and Equilibrium; 2.10 Dissociation Constants; 2.11 Ionic Conductance and Mobility; 2.12 Osmotic Pressure; 2.13 Diffusion (Flick's Law); 3. Systems Description: General Outlines of Basic Approaches; 3.1 Electrodialysis; 3.1.1 Performance Characteristics; 3.1.2 General Purpose Processor; 3.1.3 Additional Details for Appropriate Application - Desalinators for Small Boats; 3.2 pH Control: Analytic Development; 3.2.1 Introduction; 3.2.2 Some Technical Background; 3.2.3 Sample Processes for pH Control; 3.2.4 Application Possibilities

3.2.4.1 Swimming Pool Water3.2.4.2 Cooling Towers; 3.2.4.3
 Regeneration of Ion Exchange Resins; 3.2.5 Current and Electrical
 Energy Requirements; 3.2.6 Shielded (Limited Ion Access) Positive
 Electrode Operation; 3.2.6.1 Double Barrier; 3.2.6.2 Close Spacing;
 3.2.6.3 Porous Barrier Design; 3.2.6.4 Etched Electrode Surfaces; 3.3
 Biociding Technology; 3.3.1 Electrolytic Production of Free Halogens;
 3.3.2 Chlorination Process Description; 3.3.3 Bromination Process
 Description; 3.4 Ion Exchange Resin Regeneration System; 3.4.1
 General; 3.4.1.1 Present Regeneration Methods
 3.4.1.2 Electrochemical Regeneration Method3.4.2 Equipment
 Comparison; 3.4.2.1 Performance Characteristics Comparisons; 3.5
 Metals Reclamation; 3.5.1 Electrochemical Process for the Removal of
 Iron in Acid Baths; 3.5.2 Technical Approaches; 3.5.3 Technical
 Approaches; 3.5.4 Laboratory Feasibility & Data Study Suggestions;
 3.5.5 Experimental Methods; 3.5.5.1 Approach B Tests; 3.5.5.2
 Approach A; 3.5.6 Conclusions & Recommendations; 4. Mathematical
 Analysis & Modeling Electrodialysis Systems; 4.1 Electrodialysis:
 Descriptions and Definitions; 4.2 Basic Assumptions and Operating
 Parameters
 4.2.1 Electrolytic Conductivity4.2.2 Solute Concentration & Electrical
 Conduction; 4.2.3 Electric Charge Equivalence; 4.2.4 Coulombic
 Efficiency; 4.2.5 Coefficients of Performance; 4.3 Parametric Analysis:
 Flow-Through Configuration; 4.3.1 Performance Analysis of Electro-
 dialytic Systems, Part I; 4.3.1.1 First Approximation; 4.3.1.2 Design
 Assumptions; 4.3.1.3 Equation Development; 4.3.1.4 Resistance of a
 Cell; 4.3.2 Further Definition of Terms; 4.3.2.1 Average Current
 Density; 4.3.2.2 Entrance & Exit Current Densities; 4.3.2.3 Water Flow
 Rate in Processed Chamber
 4.3.2.4 Solute Concentration Along the Length of the Cell

Sommario/riassunto

Even though most of the Earth's surface is covered with water, most of it is not directly usable for human consumption or applications. As the population increases and our general style of living standards increase, the importance useable water is becoming acute. This book addresses this issue with approaches to treating water sources that require removal of unwanted or dissolved substances. In particular, it covers various methods for removing dissolved ionic materials. There are numerous methods for accomplishing this end, and the book reviews most of them in some depth.