Record Nr.	UNINA9910823721803321
Titolo	MWH's water treatment [[electronic resource] ] : principles and design / / John C. Crittenden [et al.] ; with contributions by James H. Borchardt
Pubbl/distr/stampa	Hoboken, N.J., : John Wiley & Sons, c2012
ISBN	1-62198-218-1 9786613619013 1-280-58918-3 1-118-10375-0 1-118-13147-9 1-118-10377-7
Edizione	[3rd ed.]
Descrizione fisica	1 online resource (1945 p.)
Classificazione	TEC009020
Altri autori (Persone)	CrittendenJohn C <1949-> (John Charles) BorchardtJames H
Disciplina	628.1/62
Soggetti	Water - Purification
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Rev. ed. of: Water treatment principles and design. 2nd ed. c2005.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro Title Page Copyright Preface Important Features of This Book The Use of This Book Acknowledgments Foreword Chapter 1: Introduction 1.1 History of the Development of Water Treatment 1.2 Health and Environmental Concerns 1.3 Constituents of Emerging Concern 1.4 Evolution of Water Treatment Technology 1.5 Selection of Water Treatment Processes References Chapter 2: Physical and Chemical Quality of Water 2.1 Fundamental and Engineering Properties of Water 2.2 Units of

1.

Helminths of Concern in Drinking Water -- 3.7 Algae of Concern in Drinking Water -- 3.8 Assessing the Presence of Pathogens in Source Water -- Problems and Discussion Topics -- References -- Chapter 4: Water Quality Management Strategies -- 4.1 Objectives of Water Treatment -- 4.2 Regulatory Process for Water Quality -- 4.3 Water Quality Standards and Regulations -- 4.4 Overview of Methods Used to Treat Water -- 4.5 Development of Systems for Water Treatment -- 4.6 Multiple-Barrier Concept -- Problems and Discussion Topics --References -- Chapter 5: Principles of Chemical Reactions -- 5.1 Chemical Reactions and Stoichiometry -- 5.2 Equilibrium Reactions --5.3 Thermodynamics of Chemical Reactions -- 5.4 Reaction Kinetics --5.5 Determination of Reaction Rate Laws.

5.6 Reactions Used in Water Treatment -- Problems and Discussion Topics -- References -- Chapter 6: Principles of Reactor Analysis and Mixing -- 6.1 Types of Reactors Used in Water Treatment -- 6.2 Mass Balance Analysis -- 6.3 Hydraulic Characteristics of Ideal Reactors --6.4 Modeling Reactions in Completely Mixed Batch Reactors -- 6.5 Modeling Reactions in Ideal Continuous-Flow Reactors -- 6.6 Using Tracers to Characterize Hydraulic Performance of Nonideal Reactors --6.7 Modeling Hydraulic Performance of Nonideal Reactors -- 6.8 Modeling Reactions in Nonideal Reactors -- 6.9 Using Tracer Curves to Model Reactions in Reactors -- 6.10 Mixing Theory and Practice --Problems and Discussion Topics -- References -- Chapter 7: Principles of Mass Transfer -- 7.1 Introduction to Mass Transfer -- 7.2 Molecular Diffusion -- 7.3 Sources for Diffusion Coefficients -- 7.4 Models for Mass Transfer at an Interface -- 7.5 Correlations for Mass Transfer Coefficients at an Interface -- 7.6 Design of Treatment Systems Controlled by Mass Transfer -- 7.7 Evaluating the Concentration Gradient with Operating Diagrams -- 7.8 Mass Transfer across a Gas-Liquid Interface -- 7.9 Enhancement of Mass Transfer across an Interface by Chemical Reactions -- Problems and Discussion Topics --References -- Chapter 8: Chemical Oxidation and Reduction -- 8.1 Introduction to Use of Oxidation Processes in Water Treatment -- 8.2 Fundamentals of Chemical Oxidation and Reduction -- 8.3 Conventional Chemical Oxidants -- 8.4 Photolysis -- Problems and Discussion Topics -- References -- Chapter 9: Coagulation and Flocculation -- 9.1 Role of Coagulation and Flocculation Processes in Water Treatment -- 9.2 Stability of Particles in Water -- 9.3 Coagulation Theory -- 9.4 Coagulation Practice -- 9.5 Coagulation of Dissolved Constituents -- 9.6 Flocculation Theory -- 9.7 Flocculation Practice.

Problems and Discussion Topics -- References -- Chapter 10: Gravity Separation -- 10.1 Classification of Particles for Settling -- 10.2 Principles of Discrete (Type I) Particle Settling -- 10.3 Discrete Settling in Ideal Sedimentation Basins -- 10.4 Principles of Flocculant (Type II) Settling -- 10.5 Principles of Hindered (Type III) Settling -- 10.6 Conventional Sedimentation Basin Design -- 10.7 High-Rate Sedimentation Processes -- 10.8 Physical Factors Affecting Sedimentation -- 10.9 Dissolved Air Flotation -- Problems and Discussion Topics -- References -- Chapter 11: Granular Filtration --11.1 Brief History of Filtration -- 11.2 Principal Features of Rapid Filtration -- 11.3 Properties of Granular Filter Media -- 11.4 Hydraulics of Flow through Granular Media -- 11.5 Particle Removal in Rapid Filtration -- 11.6 Rapid Filter Design -- 11.7 Rapid Filter Design Example -- 11.8 Other Filtration Technologies and Options --Problems and Discussion Topics -- References -- Chapter 12: Membrane Filtration -- 12.1 Classification of Membrane Processes --12.2 History of Membrane Filtration in Water Treatment -- 12.3

Principal Features of Membrane Filtration Equipment and Operation --12.4 Properties of Membrane Materials -- 12.5 Particle Capture in Membrane Filtration -- 12.6 Hydraulics of Flow through Membrane Filters -- 12.7 Membrane Fouling -- 12.8 Process Design -- Problems and Discussion Topics -- References -- Chapter 13: Disinfection --13.1 Historical Perspective -- 13.2 Methods of Disinfection Commonly Used in Water Treatment -- 13.3 Disinfection Kinetics -- 13.4 Disinfection Kinetics in Nonideal Flow-Through Reactors -- 13.5 Disinfection with Free and Combined Chlorine -- 13.6 Disinfection with Chlorine Dioxide -- 13.7 Disinfection with Ozone -- 13.8 Design of Disinfection Contactors with Low Dispersion. 13.9 Disinfection with Ultraviolet Light -- Problems and Discussion Topics -- References -- Chapter 14: Air Stripping and Aeration -- 14.1 Introduction to Air Stripping and Aeration -- 14.2 Gas-Liquid Equilibrium -- 14.3 Classification of Air-Stripping and Aeration Systems -- 14.4 Fundamentals of Packed-Tower Air Stripping -- 14.5 Analysis and Design of Packed-Tower Air Stripping -- 14.6 Analysis of Low-Profile Air Strippers -- 14.7 Analysis of Spray Aerators -- 14.8 Other Air-Stripping and Aeration Processes -- Problems and Discussion Topics -- References -- Chapter 15: Adsorption -- 15.1 Introduction to Adsorption Phenomena -- 15.2 Manufacture. Regeneration, and Reactivation of Activated Carbon -- 15.3 Fundamentals of Adsorption -- 15.4 Development of Isotherms and Equations Used to Describe Adsorption Equilibrium -- 15.5 Powdered Activated Carbon -- 15.6 Granular Activated Carbon -- Problems and Discussion Topics --References -- Chapter 16: Ion Exchange -- 16.1 Evolution of Ion Exchange Technology -- 16.2 Synthetic Ion Exchange Media -- 16.3 Properties of Ion Exchange Media -- 16.4 Ion Exchange Equilibrium --16.5 Ion Exchange Kinetics -- 16.6 Ion Exchange Process Configurations -- 16.7 Engineering Considerations in Ion Exchange Process Design -- 16.8 Ion Exchange Process Design Case Study --Problems and Discussion Topics -- References -- Chapter 17: Reverse Osmosis -- 17.1 Classification of Membrane Processes -- 17.2 Applications for Reverse Osmosis -- 17.3 History of Reverse Osmosis in Water Treatment -- 17.4 Reverse Osmosis Process Description --17.5 Reverse Osmosis Fundamentals -- 17.6 Fouling and Scaling --17.7 Reverse Osmosis Process Design -- Problems and Discussion Topics -- References -- Chapter 18: Advanced Oxidation -- 18.1 Introduction to Advanced Oxidation -- 18.2 Ozonation as an Advanced Oxidation Process. 18.3 Hydrogen Peroxide/Ozone Process for Potable Water -- 18.4 Hydrogen Peroxide/UV Light Process -- 18.5 Other Advanced Oxidation Processes -- Problems and Discussion Topics -- References -- Chapter 19: Disinfection/Oxidation By-products -- 19.1 Introduction -- 19.2 Free-Chlorine By-products -- 19.3 Chloramine By-products -- 19.4 Chlorine Dioxide By-products -- 19.5 Ozone Byproducts -- Problems and Discussion Topics -- References -- Chapter 20: Removal of Selected Constituents -- 20.1 Traditional, Nontraditional, and Emerging Constituents -- 20.2 Arsenic -- 20.3 Iron and Manganese Removal -- 20.4 Softening -- 20.5 Nitrate -- 20.6 Radionuclides -- 20.7 Pharmaceuticals and Personal Care Products --Problems and Discussion Topics -- References -- Chapter 21: Residuals Management -- 21.1 Defining the Problem -- 21.2 Physical, Chemical, and Biological Properties of Residuals -- 21.3 Alum and Iron Coagulation Sludges -- 21.4 Lime Precipitation Sludges -- 21.5 Diatomaceous Earth Sludges -- 21.6 Granular and Membrane Filter Waste Washwater -- 21.7 Reverse Osmosis Concentrate -- 21.8 Ion Exchange Brine -- 21.9 Solid Sorbent Brines and Washwater -- 21.10

	Management of Residual Liquid Streams 21.11 Management of Membrane Concentrates and Cleaning Solutions 21.12 Management of Ion Exchange Brines 21.13 Management of Brines and Washwater from Sorption Processes 21.14 Management of Residual Sludges 21.15 Ultimate Reuse and Disposal of Semisolid Residuals 21.16 Management of Spent Solid Sorbents 21.17 Process Selection Problems and Discussion Topics References Chapter 22: Internal Corrosion of Water Conduits 22.1 Materials Used to Transport, Distribute, and Store Water 22.2 Thermodynamics of Metallic Corrosion 22.3 Electrokinetics of Metallic Corrosion 22.4 Application of Electrokinetics. 22.5 Microbiologically Induced Corrosion.
Sommario/riassunto	"Updating the most comprehensive and complete guide to water treatment planning and design, this edition maintains the book's broad scope and reach, while reaching the working professional with additional worked problems and new treatment approaches. It covers both the principles and theory of water treatment as well as the practical considerations of plant design and distribution. The contents have been updated to cover changes to regulatory requirements, testing methodology, and design approaches, as well as the emergent topics of pharmacological agents in the water supply and treatment strategies"