

1. Record Nr.	UNINA9911019847503321
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Titolo	A basic introduction to pollutant fate and transport : an integrated approach with chemistry, modeling, risk assessment, and environmental legislation / / Frank M. Dunnivant, Elliot Anders
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Interscience, c2006
ISBN	1-280-34968-9 9786610349685 0-470-32323-X 0-471-75813-2 0-471-75812-4
Descrizione fisica	1 online resource (504 p.)
Altri autori (Persone)	AndersElliot
Disciplina	628.5/2 628.52
Soggetti	Pollution - Mathematical models Pollutants Environmental chemistry Environmental risk assessment Environmental policy
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	A BASIC INTRODUCTION TO POLLUTANT FATE AND TRANSPORT; CONTENTS; PREFACE; To the Instructor; To the Student; To the Environmental Professional; How to Use the Book with Fate® and Associated Software; Acknowledgments; SYMBOLS; GLOSSARY; PART I INTRODUCTION; CHAPTER 1 SOURCES AND TYPES OF POLLUTANT, WHY WE NEED MODELING, AND HISTORICAL CONTAMINATION EVENTS; 1.1 Introduction; 1.2 The Need for Modeling of Pollutants in Environmental Media; 1.3 Pollution Versus Contamination; Pollutant Versus Contaminant; 1.4 Pollution Classifications; 1.5 Sources of Pollution 1.6 Historic Examples of Where Fate and Transport Modeling are Useful1.6.1 Surface Water; 1.6.2 Groundwater; 1.6.3 Atmosphere; 1.7 Environmental Laws; References; PART II CHEMISTRY OF FATE AND

TRANSPORT MODELING; CHAPTER 2 BASIC CHEMICAL PROCESSES IN POLLUTANT FATE AND TRANSPORT MODELING; 2.1 The Liquid Medium: Water and the Water Cycle; 2.2 Unique Properties of Water; 2.3 Concentration Units; 2.4 Chemical Aspects of Environmental Systems; 2.4.1 pH; 2.4.2 Activity; 2.4.3 Solubility; 2.4.4 Vapor Pressure; 2.4.5 Henry's Law Constant; 2.5 Reactions and Equilibrium; 2.5.1 Acid-base Chemistry; 2.5.2 Oxidation-Reduction Chemistry; 2.6 Complexation; 2.7 Equilibrium Sorption Phenomena; 2.7.1 Sorption Surfaces; 2.7.2 Organic Matter; 2.7.3 Organic Sorbates; 2.7.4 Partition Coefficients, K_d and K_p ; 2.7.5 Ion Exchange Phenomena for Ionic Pollutants; 2.8 Transformation/Degradation Reactions; 2.8.1 Abiotic Chemical Transformations/Degradations; 2.8.2 Photochemical Transformation/Degradation Reactions; 2.8.3 Nuclear; 2.8.4 Biological; 2.9 Summary; References; CHAPTER 3 QUANTITATIVE ASPECTS OF CHEMISTRY TOWARD MODELING; 3.1 Introduction; 3.2 Calculation of the Free Metal Ion Concentration in Natural Waters; 3.2.1 Calculating Chemical Equilibria; 3.2.2 Equilibrium Applied to More Complex Speciation Problems; 3.3 Methods for Determining K_d and K_p ; 3.4 Kinetics of the Sorption Process; 3.5 Sorption Isotherms; 3.5.1 A General Approach; 3.6 Kinetics of Transformation Reactions; 3.7 Putting It All Together: Where Chemistry Enters into the Modeling Effort; Case I: A Metal Pollutant; Case II: Hydrophobic Pollutants; References; PART III MODELING; CHAPTER 4 AN OVERVIEW OF POLLUTANT FATE AND TRANSPORT MODELING; 4.1 Modeling Approaches; 4.1.1 Algebraic Solutions; 4.1.2 Modeling Using Differential Equations; 4.1.3 The General Approach for the Models Used in this Text; 4.1.4 Numerical Methods of Analysis; 4.2 The Quality of Modeling Results; 4.3 What Do You Do with Your Modeling Results?; References; CHAPTER 5 FATE AND TRANSPORT CONCEPTS FOR LAKE SYSTEMS; Case Study: Lake Onondaga; 5.1 Introduction; 5.2 Types of lakes and lake-forming events; 5.3 Input Sources; 5.4 Stratification of Lake Systems; 5.5 Important Factors in the Modeling of Lakes: Conceptual Model Development; 5.5.1 Definitions of Terms; 5.5.2 Detention Times and Effective Mixing Volumes

Sommario/riassunto

A uniquely accessible text on environmental modeling designed for both students and industry personnel. Pollutant fate and modeling are becoming increasingly important in both regulatory and scientific areas. However, the complexity of the software and models often act as an inhibitor to the advancement of water quality science. A Basic Introduction to Pollutant Fate and Transport fills the need for a basic instructional tool for students and environmental professionals who lack the rigorous mathematical background necessary to derive the governing fate and transport equations.