

in both freshwater and marine systems. Not only are many chemicals toxic, but also they are persistent.

This volume focuses on approaches for identifying and quantifying contaminants in sediments and methods for studying the fate and transport of contaminants in sediments and wetlands. Several sections within the volume address specific categories of contaminants—PCBs, PCDD/Fs, hydrocarbons, and heavy metals—while others focus on modeling for site characterization, full-scale characterization, and pilot studies.

This volume contains 41 papers written by scientists from 15 different countries. The papers are divided into the following categories:

- PCB- and PCDD/F-contaminated sites (five papers),
- Heavy metals-contaminated sites (eight papers),
- Modeling for site characterization (eight papers),
- Full-scale site characterization (seven papers),
- Pilot studies (seven papers),
- Oil and gas industry-contaminated sites (six papers).

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Partition and Adsorption of Organic Contaminants in Environmental Systems

Cary T. Chiou (Ed.), Wiley/Interscience, New York, NY, 2002, US\$ 89.95, 267 pp., ISBN 0-471-23325-0

The author introduces the book in his preface as follows:

The concern for the presence of a wide variety of contaminants in the environment calls for development and assemblage of information about their behavioral characteristics, so that appropriate strategies can be adopted to either prevent or minimize their adverse impacts on human welfare and natural resources. This information is especially warranted for toxic chemicals that persist for extended periods of time in the environment. When chemicals enter the environment, they are usually not confined to a specific location, but rather are in dynamic motion either within a medium or across the adjacent media. The propensity for a contaminant to move into and distribute itself between the media (or phases) is determined by its physical and chemical properties and environmental factors and variables. The quantity of a contaminant in a given medium and the state of its existence affect its environmental impact. It is therefore important to understand what drives a contaminant from one medium to another and the manner and extent that a contaminant associates with the different media or phases within a local environmental system.

This book will aid markedly in that task.

The book provides that information by describing how

... nonionic organic contaminants are sorbed to natural biotic and abiotic substances. The book focuses on physical principles and system parameters that affect the contami-

nant uptake by soil from water, air, and other media. Since contaminant uptake by natural organic substances is often predominantly by a partition interaction, the partition characteristics in several solvent–water model mixtures are treated in some detail to elucidate the relevant physicochemical parameters.

There are eight chapters in the book, titled as follows.

1. *Important thermodynamic properties*: discussed the first and second laws of thermodynamics, chemical potential (in single and multiple phases), activity of a substance and vapor–liquid and vapor–solid equilibria.
2. *Fundamentals of solution theory*: discussed Raoult’s Law, Henry’s Law, the Flory–Huggins Theory, variation of activity coefficient with concentration, molar heat of solution and cohesive energy density and solubility parameter.
3. *Interphase partition equations*: discussed the partition of chemicals between: (a) two separate phases; (b) organic solvent in water; and (c) molecular phase in water. Also discussed are the temperature and concentration dependence of the partition coefficient.
4. *Fundamentals of adsorption theory*: discussed the basic isotherm theories advanced by Langmuir and Freundlich. This basic discussion is followed by adsorption theories: (a) BET and (b) Polanyi.
5. *Contaminant partition and bioconcentration*: systems treated in this section are: (a) octanol–water; (b) heptane–water; and (c) butanol–water. The octanol–water system receives the most attention, according to Chiou, “. . . because of the observed correlations between the octanol–water partition coefficients and the partition effects with natural organic substances and biological components”.
6. *Adsorption of vapors on minerals and other solids*: in this chapter Chiou examines first the adsorption data of nitrogen vapor on a few representative minerals and solids and then uses the nitrogen adsorption data to calculate the surface areas and micropore volumes of the samples.
7. *Contaminant sorption to soils and natural solids*: encompassing just over 100 pages, this chapter is the longest chapter in the book and it should be, as this is where the author begins to utilize the material and theory developed in the first six chapters.
8. *Contaminant uptake by plants from soil and water*.

The book ends with an extensive 14-page bibliography.

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Environmental Sampling and Analysis for Metals

Maria Churos, Csaba Churos, Lewis Publishers, Boca Raton, FL, 2002, US\$ 89.95, 394 pp., spiral bound, ISBN 1-56670-572-X

Metals are ubiquitous pollutants of air, water, and solid waste. The determination of their concentrations in these media is a very important part of environmental control strategies. This book addresses that topic.