

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.

Gary F. Bennett

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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.

The authors are associated with the University of Pecs, Hungary. This book is the fourth one published by the first author and the second published by the second author; all these texts deal with sampling and analysis of environmental metals. Although these authors are foreign based, the book, from the perspective of laws and regulation-based analytical procedures, is written to address US laws, standards, and procedures.

The book has 19 chapters, 12 short appendices, and a very brief list of references. The key chapters are entitled:

- Introduction to Metals;
- Discussion of Metallic Elements;
- Toxicity of Metals;
- Standards Related to Metallic Pollutants;
- Fundamentals of Spectroscopy;
- Molecular Spectrophotometry;
- Atomic Absorption Spectrometry;
- Direct Aspiration or Flame Atomic Absorption Spectrometry;
- Graphite Furnace Atomic Absorption Spectrometry;
- Cold-Vapor Atomic Absorption Spectrometry;
- Hydride-Generation Atomic Absorption Spectrometry;
- Inductively Coupled Plasma Atomic Emission Spectroscopy;
- Quality Control in Metals Analysis;
- Sample Collection for Metals Analysis;
- Sample Preparation for Metals Analysis;
- Converting Raw Data into Reportable Form;
- Reporting Analytical Data;
- Selected Methods for Determination of Metals in Environmental Samples;
- Laboratory Safety Rules.

The book details the methods utilized by the chemist for metallic ion analysis. However, one can see from the outline of the chapter titles that the authors have discussed metal toxicity, sample preparation, data reporting, and laboratory safety.

As advertised, the book is “. . . a comprehensive and easy-to-read text for laboratory technicians and analytic chemists who need a guide for analyzing metals in environmental samples and a reference for analytical and quality control procedures.”

Gary F. Bennett

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### **Environmental Analysis of Contaminated Sites**

G.I. Sunahara, A.Y. Renoux, C. Thellen, C.L. Gaudet, A. Pilon (Eds.), John Wiley & Sons Ltd., New York, NY, 2002, US\$ 115.00, 488 pp., ISBN 0-471-98669-0

This book evolved from a workshop entitled “Toxicity Testing Applied to Soil Ecotoxicity”. The 1995 workshop was held in Montreal, Que., Canada, under the auspices of the National