

## Book reviews

### **Chemical Analysis of Contaminated Land**

K. Clive Thompson, C. Paul Nathanail (Eds.), Blackwell Publishing/CRC Press, Oxford, UK, 2003, £89.50, 305 pp., ISBN: 1-84127-334-1

In the United States, the EPA's Brownfield Program addresses the problem of abandoned, contaminated industrial sites. Most of those sites are in industrial cities and, if allowed to remain vacant, represent a terrible waste of urban land. Therefore, much effort is being devoted to their cleanup. But before that cleanup can begin (or end), chemical analysis of the soil and material on the site is needed both for risk assessment and for planning the cleanup process. Needed for that determination is an understanding of the initial concentration of site contaminants and a final goal of their concentration at the end of the remediation process.

The editors write in the preface that this book sets out to provide a description of the chemical analysis of potentially contaminated land for all those involved in risk assessment. This book contains 10 chapters, which the editors note, distill the expertise and experience of their contributors in the analysis of contaminated land. The book's contents are well-described by the editors in the preface. Chapter 1 is an introductory chapter written by the editors. It focuses on "the risk assessor as a customer". Chapter 2 highlights the difficulty in developing robust methods of analysis that cover all the soil matrices likely to be encountered. . . Chapter 3 tackles the problem of preparing submitted samples for analysis. . . The following five chapters cover the analysis of metals, including a brief discussion on speciation analysis (Chapter 4), the analysis of inorganic parameters such as cyanide, pyrites, total sulphur and asbestos. . . (Chapter 5), petroleum hydrocarbons, including polyaromatic hydrocarbons (Chapter 6), volatile organic compounds (Chapter 7) and non-halogenated organic compounds, including semi-volatile organic compounds. . . (Chapter 8). Chapter 9 deals with leaching tests [while]. Chapter 10 describes the use of toxicity tests in ecological assessment and toxicity screening of potentially contaminated land.

I found the last chapter entitled "Ecological assessment in toxicity screening in contaminated land analysis" particularly interesting as ecotoxic assessment is based on biological methods in contrast to chemical determination of the concentration of chemicals. This new concept can be used to evaluate the effects of toxic chemicals on humans and the environment. The authors describe the process this way: "Toxicity testing comprises the evaluation of effects of

known chemicals on ecological receptors (ecotoxicity tests), and the measurement of effects exhibited by contaminated media (bioassays). For ecotoxicity testing, key test organisms are exposed to a range of concentrations of a series of potentially toxic agents and the resulting adverse effects are measured".

Bioassay tests conducted with solid samples include: invertebrate tests, plant tests, and microbial tests with single species. The use of bioassays for toxicity screening is advantageous because of the short test periods and rapid access to sufficient test organisms. Bioassays provide information that may not be obtained through chemical analysis. This chapter ends with a description of the bioassay tests conducted with earthworms (acute toxicity test and reproduction test), Collembola, Enchytreid, plant tests, microbial tests, and invertebrate tests.

This is a very well written book with a comprehensive review of the numerous tests that may be used to evaluate contaminated land. It should be extremely useful both to the bench chemist as well to the engineer who has responsibility of understanding safe site cleanup and a desirable end point for that process.

G.F. Bennett

doi: 10.1016/j.jhazmat.2004.03.010

### **Adsorbents: Fundamentals and Applications**

Ralph T. Yang, John Wiley & Sons, Hoboken, NJ, 2003, US\$ 94.95, 422 pp., ISBN: 0-471-29741-0

Most of the environmental papers I have received for publication in the Journal that deal with adsorption have involved the adsorption of organics on activated carbon, while several others have reported on the adsorption of heavy metals on a variety of natural substrates. These topics are discussed in Yang's book, but not until Chapter 5 where Yang also notes the popularity of activated carbon: "Activated carbon is the most widely used sorbent. Its manufacture and use date back to the 19th century. Its usefulness derives mainly from its large micropore and mesopore volumes and the resulting high surface area". Yang does discuss, albeit briefly, the details of carbon adsorption in the above noted chapter. Section topics in this chapter are: (1) formation and manufacture of activated carbon, (2) pore structure and standard tests for activated carbon, (3) general adsorption properties, (4) surface chemistry and its effects on adsorption, (5) ad-