

## Book reviews

**Lead: Chemistry, Analytical Aspects, Environmental Impact and Health Effects, J.S. Casas, J. Sordo (Eds.). Elsevier, Amsterdam, the Netherlands (2006). 365 pp., Price: US\$ 230.00, ISBN: 0-444-52945-4**

Lead, the editors note in their Preface, has been utilized almost since the beginning of civilization during which time it has been very useful but also harmful to human health. Lead has been mined and used in industrial and domestic products for centuries. Its unique properties (malleability, low melting point and resistance to corrosion) make it one of the most widely used metals—in water pipes, coffins, alloys, solder, cosmetics, gasoline and lead paint.

The authors of the first chapter write that: “The dangers of lead toxicity, the clinical manifestations of which are termed ‘plumbism’ have been known since ancient times. Significant exposure to lead is an environmental threat to optimal health and to the physical development of young children; lead affects all socio-economic groups.” “Lead induces a broad range of physiological, biochemical and behavioral dysfunctions.” “Lead is known to affect the structure and function of various organs and tissues.”

Lead has been used for many years BC in amounts exceeding thousands of tons per year. The authors cite usage figures from the Copper Age (3900–2100 BC) in Aegean Greece and Asia Minor.

Casas and Sordo discuss the historical evolution of lead poisoning which is a malady. They note, that lead poisoning has been a problem since antiquity. They present a table showing the estimated intake of lead during the Roman Empire times. Their figures include lead from water, wines, foods, etc. For the Aristocrat, the lead intake was 250  $\mu\text{g}/\text{day}$ ; for the Plebeian, it was 35  $\mu\text{g}/\text{day}$ ; while for the slave it was 15  $\mu\text{g}/\text{day}$ . The difference in intake for the Aristocrats was mainly due to wine consumption.

Continuing in Chapter 1, the authors discuss the properties of lead. This discussion includes atomic, physical and chemical properties. The chapter ends with a brief discussion of the use of lead over the years. These uses include batteries, lead sheet for radiation shielding, flashings and weatherings in building construction, lead pipes for domestic water supplies (a use which, as noted before, has decreased markedly), sheathing material for power cables and alloys.

Following this introductory chapter which, as noted, discusses the historical background of lead, are chapters entitled:

- Lead(II) coordination chemistry in the solid state.

- Organolead chemistry.
- Environmental occurrence, health effects and management of lead poisoning.
- Analytical procedures for the lead determination in biological and environmental samples.

Chapter 2 “. . . deals with the coordination chemistry of Pb(II) in the solid state, a particularly fascinating field that has experienced a clear resurgence in the last two decades.”

Chapter 3 is an examination in depth of the chemistry of organolead compounds. While organolead compounds are clearly dominated by the tetravalent state, recently fascinating chemistry of Pb(II) organometallics has been developed. This topic is discussed in detail with liberal use of molecular diagrams.

Chapter 4 is almost a book in itself. In this chapter, the authors review much of the material presented in the first chapters, including the historical background of lead in the environment: its occurrence, sources (lead paint, batteries, gasoline, newsprint, pencils, jewelry) and delivery to humans (drinking water, air, soil and dust). Other sections of this chapter discuss occupational lead poisoning, lead’s biological impact, its biochemical and toxicological effects and preventative measures.

The final chapter discusses in depth analytical methods for the determination of lead in biological and environmental samples. These methods include UV–vis absorption spectrometry, atomic absorption spectrometry, atomic emission spectrometry, thermal ionization mass spectrometry, X-ray fluorescence spectrometry and anodic stripping voltammetry. Having discussed the various methods of determining lead concentrations, the authors outline the determination of lead in biological samples such as blood, urine and tissues. Lead determination in environmental samples (plants, water, soils and sediments) is the last major section of this chapter.

Gary F. Bennett\*

*Department of Chemical and Environmental Engineering,  
The University of Toledo, Mail Stop 305,  
Toledo, OH 43606-3390, United States*

\* Tel.: +1 419 531 1322; fax: +1 419 530 8086.  
E-mail address: [gbennett@eng.utoledo.edu](mailto:gbennett@eng.utoledo.edu)

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