Book Review

Aluminum in Chemistry, Biology and Medicine

Edited by M. Nicolini, P. F. Zatta and B. Corain, Cortina International, Verona, 1991.

This timely book consists of the material from a series of invited lectures given at the University of Padova in 1991. There are two papers on chemistry. The first, by R. B. Martin, provides a concise review of aluminium in biological systems, and emphasises hydrolytic equilibria and the binding of phosphate, amino acids, carboxylates and other ligands to aluminium(III). Aluminium determination in complex matrices is considered by S. Constanttini and R. Giordano; this is concerned with the electrothermal graphite furnace technique to determine aluminium at very low concentrations (5 to 20 μl) in very small sample sizes (*c.* 1 μg/l). Other sections of the book are concerned with biology and medicine, respectively, but are certainly not without interest for the chemist. There are chapters on aluminium and membrane channels (M. Colombini); aluminium and neurodegenerative disorders (J. Savory); and on the toxicity of aluminium and the effect of silicon on its bioavailability (J. D. Birchall). The medical papers concern aluminium intoxication: recognition and treatment (A. C. Alfrey); Alzheimer's disease and the aluminium hypothesis (J. A. Edwardson *et al.*); aluminium(III) toxicity and blood–brain barrier permeability (P. F. Zatta, M. Nicolini and B. Corain). There is a final Commentary by H. M. Wisniewski on the vexed question of the association of aluminium and Alzheimer's disease.

One message that comes through very clearly is that the chemists' skills are much needed to unravel details, as yet only sketchily explored, of the basic hydrolytic and coordination chemistry of the element, and there is much to do in the field of specific chelating reagents for the element. The chapter on aluminium toxicity makes the point that aluminium is relatively abundant in the biosphere but has apparently no useful function for plants or animals; on the contrary, it is toxic to both (thus, as Martin's article points out, aluminium is an acknowledged causative factor in conditions arising from dialysis, e.g. renal dementia). A point of general interest to the reader, since Alzheimer's disease is so distressing and widespread (and not only in the elderly), is that while aluminium does seem to be implicated there is still no general agreement as to whether it is a cause of the disease or is simply a by-product of it. In Wisniewski's opinion "Aluminium is a dementing atom", but this is not the view of all the contributors to this interesting book.

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