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Book review

Metals in the Environment, Analysis by Biodiversity
Edited by M.N.V. Prasad, Marcel Dekker, New York, NY, 2001. 487+xii pp.; USD 185.00, ISBN 0-8247-0523-8

As interdisciplinarity in research becomes ever more common, organometallic research impinges on areas of wider and wider interest. It is already clear that subjects within the ambit of organometallic chemistry are also relevant to the chemistry of biological systems, and this book offers the opportunity to discover whether the same might be said of the chemistry of the environment.

This book attempts to describe the extent to which biodiversity in organisms such as bacteria, mosses, fungi and plants react to typical 'heavy' (generally metallic) elements in their environments and also how specific parts of plants, such as tree rings, reflect the heavy metal status of the environment at the time they were formed. As the editor states, the maintenance of biodiversity will ensure that as many as possible biological indicators remain available to monitor pollution and to aid remediation. The factors that enables an organism to accommodate massive accumulations of heavy metals raise lots of questions about biological mechanisms and transport involving these metals which must impinge upon the realms of organometallic chemistry.

The book is divided into two parts. The first deals with the uptake of a wide range of heavy metals by organisms ranging from bacteria through to brassicae. What strikes a chemist about this discussion is the absence of real chemical input. The biologist and the biochemist have obtained a vast amount of information, but the knowledge of detailed interactions within organisms at the atomic level seems to be lacking. One learns about how particular organisms respond to which metals, and even about to where these metals are transported, but how this happens, and why, are much less evident. It is sad that so many organometallic and coordination chemists still regard constructing sometimes dubious models for metalloenzymes as bioinorganic chemistry when so many more pertinent chemical questions need answering. However, dealing with these problems requires mastering the kind of material in a book such as this before meaningful problems can be formulated and attacked. It certainly helps that each chapter is generously referenced to provide a good basis for assimilating relevant literature. The second part of the book is more environmental, dealing as it does with topics such as aluminium toxicity in soils, tree crops (bark, tree rings and dendroanalysis) and metals, heavy metal interactions with potential ligating groups in soils, and soil remediation. Again, more fundamental chemical insights would be valuable here.

In conclusion, this book contains very little organometallic chemistry. It demonstrates where inorganic and coordination chemistry could make a considerable impact, and it would therefore be of considerable use to anyone attempting to make the difficult step of applying his specialist organometallic knowledge to problems of current environmental, political and economic importance.

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