schemes in a hands-on style and, despite the price and slightly dated introductory chapter, should appeal to researchers wishing to learn more about biotransformations and to those wishing to explore the possibilities of applying this technology to their own research.

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Uses of Inorganic Chemistry in Medicine

N. P. Farrell (ed.)
Royal Society of Chemistry, Cambridge, 1999
xii + 160 pages. £59.50
ISBN 0-85404-444-2

Traditionally, medicinal chemistry researchers have experienced some difficulty in adapting their thinking to embracing the role of metal ions in pharmaceuticals. This is partly because synthetic chemistry of old was based upon organic bonds, and partly because the concept of lability of metal–ligand bonding was difficult to grasp. Over the last two decades there has been much progress in this area: several books have appeared, and pharmaceutical research companies have recruited specialists in the area of metallocomplexes.

This book, edited by N. P. Farrell, is a contribution to this progress, and contains nine chapters addressing such topics as the biomedical uses of lithium, gold complexes for treating cancer and HIV, nitric oxide in physiology and medicine, therapeutic uses of manganese, vanadium in its role of a possible insulin modifier, platinum-based anticancer drugs, and the role of iron and copper in controlling oxidation damage. The authors are all well experienced in the field and give balanced overviews which make useful reading.

Progress in these areas is best made using an interdisciplinary approach, blending the most modern research techniques in chemistry with those of biology and pharmacology. This book contains selected case studies addressing topics such as those listed. The most important chemical factors are researched in order to enlighten our knowledge of the mechanistics, pharmacokinetics and tissue distribution features. Traditional factors which need to be built into any structure–activity relationship include coordination number, the geometry of the complex, the type of ligand involved, and whether the species are kinetically inert or labile.

To someone who has been in the field for several years, this book will bring the readers up-to-date in terms of progress in these various topics. Particularly valuable contributions are those concerning platinum-based anticancer agents, and it is fascinating and intriguing to see that more and more details have emerged over the last 30 years concerning the target sites for cisplatin after it has lost its two chloride ligands. Diagrams are produced which can be useful in instructing new researchers in the field concerning the exact sites of nucleophilic attack upon DNA, RNA and proteins. The more recent replacement of the two chloride leaving groups by cyclobutane dicarboxylic acid (CBDCA) is described in detail, and how it enhances, by two orders of magnitude, resistance to aquation replacing the leaving group. This is one of the rare instances in this book where chemical speciation is implicated although not mentioned by name.

This exciting area of research has continued to involve novel trinuclear platinum compounds, which have now entered the first phase of clinical trials and are designed to have a spectrum of clinical activity that is complementary to the parent cisplatin drugs.

This is an excellent volume for inspiring research students with enthusiasm for relating different aspects of inorganic chemistry to medicine. I cannot see it being prescribed as a first-choice textbook in the area, but it will be cited as useful support reading and copies should be available in libraries and in research laboratories. I imagine that pharmaceutical researchers from industry will use it to become familiar with the new terminology more closely associated with metals in medicine. The authors have put much effort into simplifying their accounts and rendering them reader-friendly, and are to be congratulated.

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Colloid–Polymer Interactions (From Fundamentals to Practice)

Paul L. Dubin and Raymond S. Farinato (eds)
John Wiley and Sons, Chichester, 1999
x + 417 pages. £74.50
ISBN 0-471-24316-7

This book is a comprehensive study of colloid–polymer interactions involving the ways polymer chains may behave at the interface. It takes the form of a series of chapters, well written by invited authors, although it must be emphasized that this is not just a collection of research articles since there is a good integration of cross-referencing throughout the volume. The editors provide an excellent preface and set the goals to be achieved by the book: firstly, to present in a non-specialist manner practical technologies that are based on colloid–polymer interactions; secondly, to put into clearer focus the models used to organize and rationalize observations; thirdly, to provide technologists and

engineers with an appropriate introduction to the fundamental information obtainable from modern experimental techniques. As implied in the title these goals are achieved by a discussion of both the fundamentals and practical applications within the three main sections of the book: *(I) Applied Technologies; (II) Fundamentals of Colloid–Polymer Interaction; and (III) Methods for Investigating Polymer Adsorption Studies*.

In Section I, important applications centre on solid–liquid separations in, for example, water treatment, paper making and mineral processing. Further discussion is presented of modifying the properties of suspensions in, for example, food and agricultural technologies, pharmaceuticals and paints.

The areas covered by Section II include an examination of the diffusion of a polymer to a surface, ranging from a simple Langmuir model to a more complex self-consistent mean-field theory for single or multiple species; aggregation of initially stable colloidal dispersions by addition of macromolecules using the bridging and depletion mechanisms; the theory of adsorption of polyelectrolytes to charged (planar or spherical) surfaces; and how small-angle neutron scattering may be applied in determining the volume fraction profiles of adsorbed polymers to surfaces.

The methods covered in the third section are wide and various, occupying seven of the 15 chapters of the book. All start with a suitable background followed by typical results and discussion, and as such are a very good introduction into the technique. The areas discussed are: NMR of surface polymers; radiochemical methods; atomic force microscopy; interferometric surface force measurements; scanning angle reflectometry; total internal reflectance fluorescence (TIRF); and the use of oscillating optical tweezers for direct measurements of colloidal forces.

Each chapter throughout the volume begins with a tutorial to inform the non-expert reader of the basics and current state of affairs in a particular subject area. In some chapters, the tutorial content could be used at a late undergraduate/early postgraduate level. For example, an early chapter gives a good discussion of DLVO theory, useful for polymer-free systems, which is then extended to include the effects of polymer addition to the system, by other authors in chapters later in the volume. Each article concludes with a good summary of its contents and very extensive referencing to provide the reader with a starting place for further study.

This book addresses the fundamental problem of how to obtain an accurate picture of the behaviour of polymer chains at interfaces. What are their configurations? It is only by obtaining such knowledge that the useful properties of colloid–polymer systems may be exploited; for example, will the system be stabilized or flocculate? It is only from a full understanding of this basic information that researchers, technologists and scientists can develop solutions both to their own individual problems and to industrial applications in the real world. This book aims to bridge the areas of theory and simulations, model systems and technology within one volume. This it achieves in an eminently satisfactory manner and should prove to be a valuable addition to any polymer or colloid chemist's library.

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Free Radicals and Iron: Chemistry, Biology and Medicine

M. C. R. Symons and J. M. C. Gutteridge
Oxford University Press, Oxford, 1998, xii + 242 pages. £65
ISBN 0-19-855892-9

In their preface to this book, whose publication is timely in view of the increasingly strident claims concerning the role of free radicals in illness and disease, the authors are admirably candid. They warn the reader that it represents the personal views of a chemist and a biochemist, that they will present different views of the subject, with minimal references, with a text kept as simple as possible, so that 'ferrophiles, scientists and medical workers' can select topics of interest with a view to consulting more specialized works; inevitably, they say, results are biased towards their own prejudices and published data. The reader who starts thus warned on the text will, I suspect, not be disappointed once the discontinuities in its rather colloquial style have been recognized and the obvious limitations acknowledged.

Following an introduction and dedication (to Fenton, of the eponymous reaction fame), Martyn Symons brings to bear his knowledge of ESR spectroscopy, radical behaviour and structure and bonding in O_2, H_2O_2, $HO^{\cdot}$ and O_2^{-} — as well as the fundamentals of aqueous iron chemistry; to accompany this section (Part I) are provided appendices concerning H. J. H. Fenton himself (a list of publications, the famous paper on Fe(II)/H_2O_2/tartaric acid), a brief review of ESR spectroscopy (including applications, radicals, spin-traps and iron chemistry) and a survey of reduction potentials. The whole approach is often idiosyncratic, in places there are distracting personal asides, and a number of errors and inconsistencies have crept in; the text is dense and most concepts will certainly need the further reading and study suggested. But an excitement and authority shows through and the mechanistic possibilities of the Fe(II)/H_2O_2 reaction are interestingly explored: $HO^{\cdot}$ and ferryl species are discussed at length.

In Part II, John Gutteridge is concerned with biological aspects of the 'Fenton reaction'. He starts with a review of the natural ligands for iron and shows how, in some cases (e.g. haem iron), reaction with lipid peroxides gives free radicals; with these and in other cases, iron must be released before reaction with H_2O_2 gives the potentially

