

Book reviews

Copper, Silver, Gold, Zinc, Cadmium, and Mercury

D. K. Breitinger and W. A. Herrmann

Synthetic Methods of Organometallic and Inorganic Chemistry, Volume 5

W. A. Herrmann (ed.)

Georg Thieme Verlag, Stuttgart, 1999

248 pages. DM 124

ISBN 3-13-103061-8

This is part of the Handbook *Synthetic Methods of Organometallic and Inorganic Chemistry* and deals with synthetic methods for copper, silver, gold, zinc, cadmium and mercury compounds. Inorganic and organometallic compounds of these metals find wide applications in organic synthesis, medicine, electrochemistry and materials science.

This book contains the experimental procedures for the preparation of a range of inorganic and organometallic compounds of these metals. Experimental procedures are well covered with important physical properties and spectroscopic data together with a selection of important references. Essential instructions on safety precautions, toxicity and air sensitivity of compounds are covered where required.

The volume is generally well produced and the methods are easy to follow but some of the diagrams could be better. However, the authors have generally succeeded in their aim of covering the experimental procedures for basic and important compounds.

Chapter 3, concerning gold complexes, appears authoritative, but the following chapters (i.e. 4, 5 and 6 for zinc, cadmium and mercury respectively) are far from comprehensive. Some important organometallic and metal–organic complexes of these metals are omitted; perhaps most notably, novel compounds developed for the deposition of chalcogenide-containing materials have been overlooked.

Despite its limitations this is useful book for all those involved in preparative organometallic or inorganic chemistry for the elements concerned.

P. O'BRIEN, M. A. MALIK
Imperial College, London

Chemistry of Advanced Materials: an Overview

L. V. Interrante and M. J. Hampden-Smith (eds)
Wiley, New York, 1998

xii + 580 pages. £70

ISBN 0-471-18590-6

Materials are all around us and within us; without materials the world would be oil drops in an ocean under a clear sky, because materials' is a generic term covering all types of solid. Advanced materials' are those of which research continues to discover new properties, which allow us to classify them. Generally, advanced materials may be important for their strength, durability, light weight, flexibility etc.—the so-called structural materials'; or they may be important for properties such as conductivity, surface area, light emission, magnetism—the functional materials'. This book deals almost exclusively with the functional materials, although the last chapter on Biomaterials' concerns a rather specific type of structural material. This is not to the books detriment, however, as the readership also breaks down into two camps (with interests in the structural and the functional), and with such a vast array of possible materials to cover it is sensible to focus on one area or the other. This book gives an excellent overview of a wide range of functional materials, presenting exciting new advances in the context of the relevant background literature.

It is clearly aimed at chemists who wish to move into the field of materials chemistry and at Ph.D. students starting out in the area, and will be of interest to senior undergraduates or M.Sc. students. As a chemist working very much at the chemicals end of materials chemistry, I found that it gave me the full materials context of our research but it also provided a fascinating insight into areas in which we are not active.

This is a multiauthored text divided into 10 scientific chapters, with a fascinating introduction which places materials research in its historical context, makes the case for closer collaboration between chemists, materials scientists and chemical engineers (I would add physicists and electronic engineers to this list) and justifies further funding for research into this important multi-disciplinary subject. The chapters (Introductory Terms and Concepts; Electron-Transfer Salt-Based Conductors, Superconductors, and Magnets; Advanced Polymeric Materials; Functional Electroactive Polymers; Polymers in Electronics, Chemical Vapor Deposition; Introduction to the Nonlinear Optical Properties of Organic Materials; Nanoparticles and Nanostructural Materials; Nanoporous Materials; Molecular Precursor Routes to Inorganic Solids; Layered Transition Metal Oxides and Chalcogenides; Biomaterials) are all written by well-known experts in the respective fields and all of them include informative (and mostly gentle!) introductions to the area which lead the reader into more detailed discussions of recent advances in the synthesis, properties and applications of the various materials systems.

It is not the intention of the authors to give comprehensive reviews of their areas but rather to give