

clusters (Rosenberg and Laine) to metal cluster catalysts dispersed on solid supports. There is plenty here for those of us involved in either catalysis or clusters, or both.

As is always the case in volumes of this sort, there is some overlap and a range of styles but the information is there for those involved in both research and teaching. Much, of course, is highly speculative, and there's nothing wrong with that! There are no serious omissions and there is the odd bonus. Certainly, the chapter devoted to catalysis by colloids (Lewis) is very welcome.

Overall, a good, useful book which will be of benefit to both researchers and teachers.

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Metallized Plastic—Fundamentals and Applications

K. L. Mittal (ed.)

Marcel Dekker, New York, 1998

xiv + 372 pages. US\$175

ISBN 0-8247-9925-9

The word 'fundamentals' in the subtitle of this book hints at accessibility to the beginner. But some disappointment may be forgiven when it becomes apparent that there is no lucid introduction to a set of unifying principles, and no stepwise revelation of the implications of those principles; in fact the contents are recently updated versions of 28 papers, delivered to a symposium in 1993, involving about 84 contributors. The plain fact is that very few symposia are dedicated to covering the fundamentals of any subject at all, and few collections of papers presented at conferences are anywhere near as accessible to the beginner as single-author books.

So I conclude that this book is not for beginners. It is actually for those already active in metallized plastics. There must be many industrial scientists engaged in this field. It is part of a much wider trend to the greater use of various different materials in juxtaposition. No longer do we simply have metals competing with plastics, we combine them to achieve more than either one could achieve by itself. Other examples of combining materials are metal-matrix fibre composites, plastics filled with minerals or silver-coated glass microspheres, aluminium/resin laminates, and syntactic foams.

The papers are well written and authoritative and have been grouped in three categories. The first deals with metallization techniques, such as vapour-phase metallization of plastics, selective metallization of optically variable devices, and the solid-phase dispersion of ultrafine metal particles, which have different properties from those of bulk metals, into a polymer by thermal relaxation. One interesting paper discusses the diffusion of noble metals and other metals at high temperatures into polyimide film. Any attempt to accelerate the

process rapidly results in a traffic jam, but low deposition rates enable many single atoms to diffuse into the bulk resin. Their progress can be mapped using radiotracer techniques.

Another paper describes the introduction of silver atoms into aramid fibres and films by exposing the aramid to solutions which are later chemically reduced to silver. This procedure is followed by electroless plating.

The other two sections are slightly shorter than the first. One deals with interfacial interactions and the other with the modification of plastics surfaces. The 'interfacial' papers tend to deal with fundamental aspects, but there is also one on the computer simulation of dielectric relaxation at metal-insulator interfaces. The final (modification) section discusses practical topics such as the adhesion of metals to fluorocarbon polymers, the surface modification of polymers by plasma and ion bombardment, and fracture mechanisms of thin metallized plastics. This last paper focuses on the measurement of the fracture energy between a thin metal film and a polyimide substrate. A non-linear approach was used because linear elastic fracture methods give an inequality in the energy balance concepts.

This book can certainly be recommended to industrial libraries where companies are active in the field of metallized plastics, and some postgraduate scientists in universities will undoubtedly find one or two topics relevant to their work, but the general reader may prefer a different format.

Each paper has a few references. The page layout is uniform and pleasing. As is customary with research papers, there are many graphs and other figures. There is a reasonable index.

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Handbook of HPLC

E. Katz, R. Eksteen, P. Schoenmakers and N. Miller (eds)

Marcel Dekker, New York, 1998

xi + 1008 pages. US\$225

ISBN 0-8247-9444-3

There are many books available on HPLC, mainly in the form of specialized texts covering either theory or specific application areas. This book, however, provides a comprehensive overview of HPLC fundamentals, techniques, instrumentation and applications in one volume. The book is split into four sections to reflect the above areas, each section comprising a number of chapters by contributing authors. Each of the 29 chapters tends to be complementary and there is very little overlap for a book of this size. The chapters also contain extensive reference lists and a good number of useful tables, and figures.