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Book reviews

Transformation of Organometallics inot Common and Exotic Materials: Design and Activation, edited by R.M. Laine (Department of Materials Science and Engineering, University of Washington, Seattle, USA), Martinus Nijhoff, Dordrecht, 1988, xviii + 288 pages. ISBN 90-247-3661-7 Dfl 175.00 \$96.00 £53.00

The thrust of organometallic chemistry over several decades has been towards the isolation and characterisation of molecular species. Research workers have devoted considerable effort and skill into avoiding decomposition of rather fragile molecules. Deliberate thermal decomposition of organometallic compounds has been a neglected topic for research. Now all that is changed: it has been realised that organometallic compounds may be converted by controlled pyrolyses into a range of useful materials and the steps involved in the conversion have become a fashionable area for investigation.

At a NATO Advanced Research Workshop held in September 1985, about 30 leading scientists from Europe and North America came together to try to find a common language and to bridge the conceptual and methodological gap between chemistry on the one hand and materials science on the other. The proceedings published in the present volume show the paucity of current knowledge about the stages by which well-defined molecular compounds are transformed into useful ceramics, and how much needs to be done in the characterisation of intermediate materials before general principles can emerge.

There are four main sections. The first covers "framework science" and comprises a ragbag of topics which the editor claims "illustrate the diversity of the fields involved and opportunities for new areas of research". The second on "preceramic polymers" deals mainly with B–N, Si–N, and Si–C frameworks. The third covers chemical vapour deposition for synthesis of intermetallic compounds of transition metals, metal silicides and sulphides, and III–V compounds. The final section deals with sol-gel processing: here the term "organometallic" refers to metal alkoxides or coordination compounds between metals and organic ligands. Much of the work in this area is by materials and glass scientists so there is more emphasis than in earlier sections on the ultrastructure (i.e. structure intermediate between molecules and extended frameworks).

It is expecting too much for a book produced like this to be coherent, but the problem is exacerbated by the diversity of individual papers and the freedom which the editors have allowed to individual authors. Some have made very worthwhile attempts to educate their fellow scientists and to find general principles; others have got bogged down in experimental detail. The book is scrappy in appearance as a variety of typefaces and line spacings have been allowed. Nevertheless, in an age when our political masters are exhorting us to do useful science, this is a stimulating and thought-provoking collection of articles.

*School of Chemistry and Molecular Sciences,
University of Sussex, Brighton BN1 9QJ (Great Britain)*

J.D. Smith