

make up the large majority of the organic derivatives: many π -cyclopentadienyls of types π -C₅H₅MY₃ and $(\pi$ -C₅H₅)₂MY₂, a few π -allyls and the isolated examples of compounds with neutral benzene and cyclooctatetraene ligands. Tables and text give preparative procedures, physical and spectroscopic properties, structural details where known, chemical reactions, applications and catalytic activity as gleaned from original research articles, patents, reviews, books, theses and conference reports with typical Gmelin thoroughness. Formulas and figures are presented where appropriate. The volumes are up-to-date, with coverage complete through 1972, but with some 1973 references as well. We welcome this new and useful contribution to the "handbook literature" of organometallic chemistry.

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DIETMAR SEYFERTH

- 1 J. Organometal. Chem., 34 (1972) C59
- 2 J. Organometal. Chem., 55 (1973) C95

Metastable Ions; by R.G. Cooks, J.H. Beynon, R.M. Caprioli and G.R. Lester, Elsevier Scientific Publishing, Amsterdam, 1973, x + 296 pages, Dfl. 75.00

This book was written with the belief that an awareness of the significance of metastable ions will extend the range of complex molecules that can be characterized by mass spectrometry. A metastable ion for this purpose is defined as one that is sufficiently stable to leave the ionization chamber but decomposes before reaching the collector. In the normal spectrometer it gives rise to broad peaks, usually spreading over one or more mass unit.

From the point of view of straight chemical analysis the observation of metastable ions is the most direct evidence for particular fragmentation pathways, which lead in turn to structural information. The field offers, in addition, rich pickings for the physical chemist, for by the analysis of peak shapes information is obtained about the conversion of internal energy of the parent ion into kinetic energy of the fragments. The book covers both of these aspects as well as giving a description of the instrumental techniques and the basic theory of the kinetic processes involved.

Examples are given in both the organic and inorganic fields and it is clearly a technique that will have wide applications in organometallic chemistry. I can recommend the book without reservations.

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