

Book review

Chemistry of free atoms and particles, by Kenneth J. Klabunde, Academic Press, New York, 1980, viii + 238 pages, \$ 29.50.

The chemistry of atomic vapors which, over the last decade has focussed to a large extent on the synthetic and mechanistic aspects of transition metal chemistry, has recently spawned three books as well as numerous reviews. In the latest of these books, K.J. Klabunde, one of the more imaginative pioneers in this area, has attempted to cover the syntheses and reactivity of all the elemental vapor species (and their subhalides, oxides, and sulfides) with the exception of H, O, S, and the halogens.

The methods of production of the various species are clearly described and the chemistry of the elemental vapors thus produced is organized according to Periodic Group. To some extent, this complements the approach of Blackborow, and Young (*Metal Vapor Synthesis in Organometallic Chemistry*) who chose to organize according to ligands. Klabunde's goals are, however, more ambitious and he is less prone to make errors in organic chemistry. In particular, the importance of the spin states of main group elements is stressed, and the influence of P.S. Skell, the author's early mentor, is readily apparent.

An important recent development has been the production of highly active metal slurries and the author's enthusiasm for this approach (of which he is a leading proponent) comes through in the text. The important role of matrix isolation techniques, which are frequently crucial to mechanistic arguments, is also placed in perspective.

Of course, there are minor gaucheries such as describing several earlier reviews (two of them by KJK) as excellent: however, since one is by the present reviewer, we can overlook such immodesty. Less trivially, the potential for the vaporization chemistry of technetium is dismissed on the grounds of its radioactivity and short half-life; the recently published 4th edition of a famous textbook points out that ^{99}Tc (1/2 life of 2.12×10^5 years) may soon be more abundant than rhenium.

To the neophyte in the field this book provides a readable introduction, while those already active in vaporization chemistry will doubtless follow up in those areas where Klabunde has pointed out relatively unexploited species or ambiguities in the literature.

*Department of Chemistry,
McMaster University,
Hamilton, Ontario (Canada)*

MICHAEL J. McGLINCHEY