

Book review

Gmelin handbook of inorganic chemistry, 8th edition, *Mo-Molybdenum, Supplement Volume A2a: Element. Physical Properties, Part 1*, Springer-Verlag, Berlin, Heidelberg, New York, Tokyo, 1985, xvii + 489 pages, DM 1818. ISBN 3-540-93519-3.

This is the seventh volume which the Gmelin Institute has published concerning the chemistry of molybdenum (System No. 53), and the third describing the element itself (Vol. A1, 1977, dealt with technological aspects of the metal; Vol. A3, 1983, described the chemical reactions of molybdenum). This particular volume is central to molybdenum chemistry, and describes the nuclear properties of molybdenum isotopes (^{85}Mo – ^{108}Mo), the atomic properties (including ionization energies, electron affinity, electronegativity, electron binding energies and X-ray spectra, optical spectra, EPR spectra, diamagnetic properties, photon cross sections, interaction with electrons, neutrons, and ions, and atomic radius) of Mo, Mo^- and Mo^{n+} ($n = 1$ – 41), the molecular properties of $[\text{Mo}_2]$, $[\text{Mo}_2]^+$, $[\text{Mo}_2]^{4+}$, and $[\text{Mo}_n]$ ($n = 3$ – 25), the thermodynamic functions of both the monoatomic and diatomic molybdenum vapour, the crystallographic properties of the metal, the electronic structure and bonding in the metal, lattice dynamics, mechanical properties, and the thermal and thermodynamic properties of the metal. The yet unpublished companion volume (A2b) will complete this list of physical properties, with a review of the electrical, magnetic and optical properties of molybdenum, together with its electrochemical behaviour.

The authors (L. Berg, G. Czack, E. Koch and J. Wagner) have performed an undervalued but invaluable task in compiling this volume: the literature is covered up to mid-1984, and the difficulty of their task is amplified both by the remarkably high number of references to the Russian literature and the huge scope of the work (ranging from atomic physics to aqueous solution chemistry). This encyclopaedic work should be in all chemistry libraries (despite its enormously high cost), and reaches the high standards of presentation, illustration and scholarship that is now taken for granted in the volumes produced by the Gmelin Institute for Inorganic Chemistry. It is now, by definition, the definitive source book for facts concerning the physical properties of molybdenum.