

Book review

Gmelin Handbook of Inorganic Chemistry, 8th edition, Mo—Molybdenum, Supplement Volume A2b: Physical Properties, Part 2. Electrochemistry, Springer-Verlag, Berlin, 1988, xvii + 352 pages, DM 1550. ISBN 3-540-93566-5.

This is the ninth volume which the Gmelin Institute has published concerning the chemistry of molybdenum (System No. 53), and the fourth describing molybdenum metal itself. The preceding volume in this series (Supplement Volume A2a; 1985) described the atomic and nuclear properties of molybdenum and its ions, the molecular properties of $[\text{Mo}_n]$ and $[\text{Mo}_n]^{y+}$, the thermodynamic functions of both 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 present volume continues the survey of the physical properties of molybdenum with a detailed coverage (124 pages) of its electrical properties (including conductivity of the bulk metal, of thin films, and of liquid (molten) metal, superconductivity, the Hall effect, magnetoresistance, thermoelectric and thermomagnetic effects, and the electron energy loss spectrum), the magnetic susceptibility and resonances of the metal (including NMR and cyclotron resonance), its optical properties, electron emission, ion emission, and atom emission.

The final (and largest) section of this volume describes the electrochemical behaviour of molybdenum. There is an interesting contrast between the 226 pages

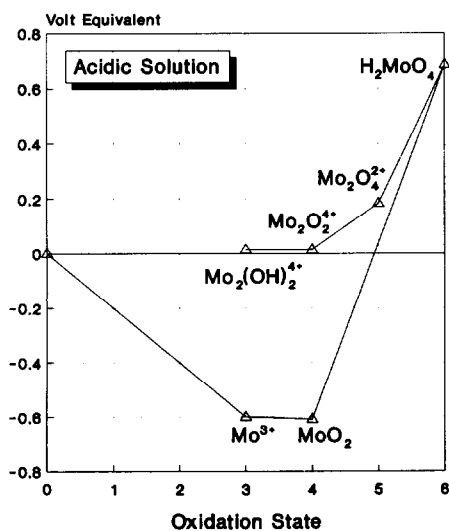


Fig. 1. A simplified volt equivalent diagram for molybdenum in acidic aqueous solution.

devoted to this topic in the current volume and the 3 pages which were given over to it in the Main Volume (1935). There are detailed sections describing standard potentials, electrode potentials (in ionic liquids as well as aqueous solution), electrokinetic phenomena, cells, behaviour as a cathode, behaviour as an anode, polarographic and voltammetric characteristics, and electrodeposition. If there is a criticism of this section, it is not that it is too detailed, but that there is no space devoted to an informed overview. A volt equivalent diagram (see Fig. 1) and some Pourbaix diagrams would have been immensely helpful for gaining an insight into the relationships between the various data sets presented. It is a classic case of not being able to see the wood for the trees.

The authors (G. Czack, W.-D. Fleischmann, D. Gras, V. Haase and G. Kirschstein) have performed a remarkable task of data compilation for this volume. The literature is covered up to mid-1986, and the value of this volume is compounded by the large number of references included to the Russian literature. It is an invaluable volume, and as with volumes in this series, should be bought by all respectable chemistry libraries, both industrial and academic.

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