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BOOK REVIEWS

Inorganic Chemistry Concepts, Vol. 3, **Mössbauer Spectroscopy and Transition Metal Chemistry**, by P. GÜTLICH, R. LINK and A. TRAUTWEIN. Published by *Springer-Verlag, Berlin-Heidelberg-New York*, 1978; clothbound, x + 280 pp. Price DM 76 (US$ 38). ISBN 3-540-08671-4.

In the last few years some books dealing with Mössbauer spectroscopy have been published (Gonser, 1975; Cohen, 1976; Gibb, 1976). The availability of these excellent texts and of less recent others (Greenwood and Gibb, 1971; May, 1971; Janot, 1972; Bancroft, 1973) has been a response to the development of this subject. Nevertheless, it has become evident that many Mössbauer problems bridge the disciplines of solid state physics and chemistry and can benefit from a common theoretical point of view. The authors have endeavoured to reach this aim by giving a particular emphasis to the theoretical methods for the description of the electronic and magnetic structure by quantum mechanical theory. Mathematical derivations are in general kept at a minimum while sound physical interpretation is emphasized. If compared with other books on Mössbauer spectroscopy, this volume might appear less broad in coverage but more advanced in theoretical topics.

The subject matter is organized in three major parts:

- the basic physical concepts, the hyperfine interactions, the experimental methodology and the mathematical evaluation of the spectra are introduced in the first five chapters (about 20% of the book);
- the interpretation of the parameters of iron and of the remaining Mössbauer active transition metals is discussed in chapters 6 and 7 respectively (*ca.* 60%);
- a selection of some applications, principally in metallurgy and biochemistry (solid state reactions, frozen solution measurements, surface studies and after effects of nuclear transformations), is introduced in the final chapter.

The material in each section is presented in a logical connection and examples are selected with care to illustrate the various points. This can also be said for the data presented in the tables and figures.

The 7th chapter is wholly devoted to the 'exotic' *d*-block Mössbauer nuclei (^{61}Ni, ^{67}Zn, ^{99}Tc, $^{99-101}$Ru, ^{107}Ag, $^{176-177-178-180}$Hf, ^{181}Ta, $^{180-182-183-184-186}$W, ^{187}Re, $^{186-188-189-190}$Os, $^{191-193}$Ir, ^{195}Pt, ^{197}Au and $^{199-201}$Hg) for which little is known and often dispersed among unknown papers and internal reports. This long chapter (112 pages!) is probably the most complete review one can find on this subject. Another enjoyable part of the book is the one concerning the 'fluctuations and transitions' in iron systems.

The book maintains the high standard set in the previous two volumes of the 'Inorganic Chemistry Concepts' series for its readability, convenience of book format, functionality of printing and drawing. The text is lucidly and concisely written and the amount of illustrative materials (19 tables and 160 figures) improves its clarity. The up-to-date nuclear data are also collected in a separate folding plate. The literature selection (up to 1976 with about 950 references) is very accurate. Only the iron chapter seems a little inadequate even considering the authors' forword.

The book may be extremely useful for chemists and physicists as a source of possible new ideas and for researchers in related fields who need Mössbauer spectroscopy to solve their problems. Some chapters may perhaps also answer advanced educational purposes.

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Synthesis and Properties of Low-dimensional Materials, Edited by J. S. MILLER and A. J. EPSTEIN, *Annals of the New York Academy of Sciences, Vol. 313*, published by *The New York Academy of Sciences, New York*, 1978; x + 828 pp. Price US$ 80.00. ISBN 0-89072-069-X.

This volume collects the papers presented at a Conference held by the New York Academy of Sciences in June 1977 and devoted to an area of fast expanding interdisciplinary research in which physical inorganic and organic chemists, physicists, material scientists and electrical engineers are involved. Inorganic, organic and polymeric materials exhibiting a high degree of structural anisotropy (linear chains, 1-D or layers, 2-D structures) and in which cooperative electronic interactions take place display unusual optical, magnetic and electrical properties. The papers reported in the volume cover many aspects of the research activity on these systems.