

## Book reviews

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*Intercalation Chemistry*; edited by M.S. Whittingham and A.J. Jacobson, Academic Press, New York and London, 1982, 595 pages, US \$ 87.50. (Series: Materials Science and Technology; edited by A.S. Nowick and G.G. Libowitz).

This volume covers the chemistry of intercalation compounds in a most authoritative and up-to-date account of the very wide variety of materials with layered structures which can act as host lattices to guest ions and molecules. The authors of the individual chapters include those who have pioneered and developed this area of chemistry and who are at present pursuing the most active new researches. They come from both academic and industrial research laboratories. These features are clearly demonstrated by a list of the chapter titles and authors: 1. Intercalation Chemistry: An Introduction, by M.S. Whittingham; 2. Graphite Chemistry, by N. Bartlett and B.W. McQuillan; 3. Sheet Silicate Intercalates: New Agents for Unusual Chemical Conversions, by J.M. Thomas; 4. Diffusion and Shape-Selective Catalysis in Zeolites, by E.G. Derouane; 5. Intercalation Chemistry of Acid Salts of Tetravalent Metals with Layered Structure and Related Materials, by G. Alberti and U. Costantino; 6. The Intercalation Chemistry of  $\beta$ -Alumina, by B.C. Tofield; 7. Organic and Organometallic Compounds of the Transition Metal Dichalconides, by A.J. Jacobsen; 8. Intercalation Chemistry of Metal Phosphorus Trichalconides, by J.W. Johnson; 9. Structural Aspects of Monovalent Cation Intercalates of Layered Dichalconides, by T. Hibma; 10. Solvated Intercalation Compounds of Layered Chalconide and Oxide Bronzes, by R. Schollhorn; 11. Intercalation of Halides, by J.D. Corbett; 12. Intercalation Chemistry of Metal Chalcogenohalides, by T.R. Halbert; 13. Hydrogen Containing Materials, by K.H.J. Buschow and H.H. Van Mal; 14. Intercalation in Biological Systems, by W.D. Wilson and R.L. Jones; 15. Reactions in Crystallographic Shear Structures, by J.S. Anderson; 16. Oxide Insertion Compounds, by P.G. Dickens and M.F. Pye; 17. Lithium Intercalation Compounds of Vanadium Chalcogenides, by D.W. Murphy; 18. Physical Properties of Intercalation Compounds of Transition Metal Dichalcogenides, by A.H. Thompson and F.J. Di Salvo.

It can be seen that the chemical aspects of the subject are emphasised. Of particular interest in the context of this Journal are the recent discoveries that many organometallic sandwich compounds can act as guest molecules in host lattices. This was first shown by Dines for cobaltocene in  $\text{TaS}_2$ . Other examples are bis- $\eta$ -benzenemolybdenum in  $\text{ZrS}_2$ , bis- $\eta$ -benzenechromium in  $\text{CdPS}_3$  and ferrocene in  $\text{FeOCl}$ . The Chapters 7 and 8 cover this new area of organometallic chemistry. It may be anticipated that there will be an extensive chemistry of organometallic-intercalation compounds.

The essence of this book is encapsulated in the introductory chapter by M.S. Whittingham who writes: "The essential feature of the intercalation reaction, and that which makes its study so exciting and profitable, is that