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BOOK REVIEW

Inorganic Experiments. Edited by J. Derek Woollins. VCH Weinheim, New York, Basel, Cambridge, Tokyo, 1994, xv+286 pp. ISBN 3-527-29235-7 ; 3-527-29253-5.

What is a lab course for? To train? To instruct? To link with theory and lecture courses? To examine and assess? To get them interested in research? Above all, perhaps to interest the student in broader fields, open up channels for further investigation? This book provides a selection of undergraduate experiments, mainly selected by teachers from U. K. universities, but with some from Continental and American sources.

A course needs a wide range of experiments, and this book provides lots of them, a total of 65 in all, a good selection, both old and new, including classic coordination compounds like $VO(acac)_2$. By coincidence, I started to read this book on the day that I noticed the redetermination of the crystal structure of $VO(acac)_2$ in the literature, as it was one of the compounds that I studied on the laboratory course that first seriously interested me in inorganic chemistry.

The book is structured, thus it starts with a selection of basic introductory experiments—simple coordination compounds like a nickel ammine and $K_3Fe(C_2O_4)_3$; a bit of qualitative analysis, including the old favourite, bis(dimethylglyoximato)nickel(II) ; IR study of the classic linkage isomers $[Co(NH_3)_5(NO_2)]Cl_2$ and $[Co(NH_3)_5(ONO)]Cl_2$; several non-metal compounds such as Fremy's salt, siloxanes and interhalogen compounds. There is room for the use of magnets to simulate atomic and molecular orbitals.

At the intermediate level, there is some serious organometallic chemistry, with the preparation and ring-substitution reactions of ferrocene of course, but it is good to see organolithium compounds introduced here. There are also macrocyclic complexes and transition metal nitrosyls, whilst this section sees more scope for spectroscopy and ligand-field theory. In the advanced section, there are η^6-arene chromium compounds among a number of additional organometallics, plus a good deal of non-metal chemistry ; the latter is a very important feature. Liquid crystals and ceramic materials are included. Another unusual feature is a section on group theory and graph theory. As one would expect, much use is made of modern spectroscopic techniques ; sampling details are generally given for each compound, though an overall section on sample preparation would not have been out of place. Special safety precautions are given for each experiment.

Obviously the book is mainly going to be purchased by the teacher rather than the student ; even so, it would have been helpful to have a few literature references given for every experiment (rather than the vast majority). Sometimes the text presumes too much, so that in the preparation of ferrocene it is assumed that the reader knows the apparatus required for the cracking of dicyclopentadiene.

This book would probably not by itself supply all the experiments needed by one institution, who would supplement it with experiments chosen from well known sources like *Inorganic Syntheses* and *Organometallic Syntheses*. Complementary in some respects are Angelici's *Synthesis and Technique in Inorganic Chemistry* and Jolly's *Synthetic Inorganic Chemistry*. It faces competition from books like Z. Szafran *et al.*'s *Microscale Inorganic Chemistry*. A wise course organiser would use their imagination in developing some of these experiments—thus the suggested synthesis of $VO(acac)_2$ together with its magnetism and IR spectrum could be supplemented by syntheses of Lewis base adducts and other spectroscopy such as ESR. Likewise, the preparation of $Co(acac)_3$ could be followed by its nitration or bromination together with NMR and IR study probing the replaced hydrogen.

I noticed a few mistakes, such as A. G. Wells (rather than A. F. Wells) on p. 21.

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