formation (10 pages). The third section describes reactivities of adducts (17 pages). The final portion deals with homogeneous catalysis of the water gas shift and related reactions. This account is a very impressive document with much tabulated data.

The review by Crabtree and Hamilton is very topical. The first section is devoted to dihydrogen-metal complexes (16 pages). The paper by Kubas et al. in 1984 has already led to much interest in this area. The second part deals with complexes containing C–H bonds as ligands (15 pages) and is largely concerned with metal complexes having agostic hydrogens. Although the first examples were observed in the mid-1960's, the existence of a clear field only became evident with the contribution of Brookhart and Green (1983). While this part of the review is undoubtedly valuable, it might have been useful to wait another two or three years before once again surveying this field. Nevertheless, Professor Crabtree has made important relevant contributions, and there is no doubt about the authority of the coverage.

The penultimate chapter is once again slightly misleading in its title. It in fact deals with organotransition metal complexes which formally may be regarded as having one or more O^{2-} ligands. The first section (4 pages) is concerned with synthesis and includes inter alia the X-ray structures of $[CpTi]_2(\mu\text{-}\eta^1 : \eta^5\text{-}C_5Me_4CH_2)(\mu\text{-}O)_2$ and $[Cp_5(O)V_6(\mu_3\text{-}O)_8]$. The second is devoted to transition metal alkyls or aryls containing oxo linkages (4 pages). The third is entitled "Oxo Alkylidene, Alkylidyne, Olefin, Acetylene, and Carbonyl Compounds" (5 pages), and including inter alia the X-ray structure of $[Fe(CO)_3][CpW(O)_2][CpW(CO)]\{\mu_3\text{-}\eta^2\text{-}C_2(C_6H_4Me)_2\}$. The fourth is concerned with cyclopentadienylmetal complexes (13 pages), and the fifth describes organometallic clusters (13 pages). The final section is concerned with organometallic polyoxometallates (5 pages) exemplified inter alia by $[CpTi(Mo_5O_{18})]^{3-}$. There is much valuable information provided in the form of tables, schemes, and structures.

The final chapter, which obviously will be of interest to the widest group of readers of this Journal, is written from the standpoint of the synthetic organometallic chemist who is interested in using NMR in an up-to-date fashion. It is, inevitably, the only contribution in this volume which is selective in its choice of examples rather than being comprehensive. One-dimensional experiments are discussed first and then 2D counterparts; the experimental aspects and some results from multinuclear NMR (all too brief) are then dealt with and, finally, some examples from solid-state NMR. Particularly conspicuous is the absence of examples taken from main group element chemistry. (There appears to be a clerical error on p. 423; ^{13}C chemical shifts surely rarely show significant temperature dependence; a "not" is missing).

School of Chemistry and Molecular Sciences
University of Sussex, Brighton BN1 9QJ (Great Britain)

M.F. Lappert

Phase Equilibria in Binary Halides, by V.I. Posypaiko and E.A. Alekseeva, IFI/Plenum, New York, Washington, London, 1987, xxv + 470 pages, $115, ISBN 0-306-65211-0.

As its title unambiguously suggests, this book contains a collection of phase diagrams and data concerning phase equilibria for binary halide mixtures (i.e.

ternary ionic systems, such as $AlCl_3$-NaCl). In 1961, the Russian Academy of Sciences published a collation of data upon molten salts covering the period 1886–1955, and this was updated in 1979. The book under review is a translation (by B. Indyk) of these Russian originals (for which, eccentrically and unfortunately, the full citations are not given), but is restricted to include only halide systems. Although some format changes have been introduced by the editor and compiler (H.B. Bell) to reduce the overall length of the work, all the data and figures from the Russian original have been included. Thus, the book is clearly and copiously illustrated, containing 287 figures, 18 tables and 1628 references. Clearly, one of the strengths of this volume is that it acts as a source book for accessing data in the Soviet literature, and much of the original work on the phase equilibria of binary halide systems was published in Russian. Of particular current interest, over thirty-five binary systems with aluminium(III) chloride, seven with aluminium(III) bromide, and nine each with aluminium(III) iodide and aluminium(III) fluoride are described.

This work is an invaluable compilation of data upon molten salt systems, and it is not surprising to find it published by Plenum who, of all the major publishers, have shown the greatest commitment to molten salt chemistry. The detailed Table of Contents makes accessing the data a facile process (although it is advisable to search this list for both components), and the data are presented in a clear, concise and uniform style. Worthy of particular mention, the concentrations are all presented as mol% (rather than in the more common, but less useful, wt%). The editor and compiler has performed a valuable service to the molten salts community, and I would like to ensure him that his hard work is fully appreciated. The volume is reasonably priced and well produced, and should be in the reference section of all chemistry libraries (as well as on a number of private shelves). Although it is of little value to the organometallic chemist, it will be welcomed by coordination chemists.

School of Chemistry and Molecular Sciences
University of Sussex, Brighton, BN1 9QJ (Great Britain)

Kenneth R. Seddon

Asymmetric Synthesis; Construction of Chiral Molecules Using Amino Acids, G.M. Coppola and H.F. Schuster, Wiley-Interscience, 1987, xiii + 393 pages, £50, ISBN 0-471-82874-2

There can be little doubt that asymmetric synthesis has become one of the most important areas of synthetic organic chemistry. This book deals with chiral syntheses which make use of the "chiral carbon pool" of naturally occurring chiral molecules, focussing in particular on reactions which use amino acids as their source of chirality. Two types of synthesis are considered. In the first the chiral carbon or carbons of the amino acid is incorporated directly into the target molecule. The second uses the amino acid as a chiral adjunct, either as a temporary feature of the molecule or as an external auxiliary, to induce chirality.

After a brief, but extremely clear, introduction the book is divided into nine chapters, each considering the uses of a particular family of amino acids in chiral synthesis. The contents build from the simplest chiral amino acid, alanine, to the more complex ones. Whilst this method of organisation might have allowed the