

Book Review

Aqueous-Phase Organometallic Catalysis, B. Cornils and W.A. Herrmann (eds.), Wiley-VCH, Weinheim, 1998, pp. xvi + 616, GB£ 140.00, ISBN 3-527-29478-3

Some years ago the exploitation of aqueous-phase organometallic chemistry would have seemed the province of a few eccentrics. However, as the editors make clear in their introduction, at least in industrial terms, aqueous-phase organometallic catalysis is a variety of more general biphasic catalysis, and it is also a bridge between heterogeneous and homogeneous catalysis, rather like catalysis on solid supports that would otherwise be undertaken in homogeneous systems.

One problem with finding a suitable reviewer for this book was that those approached generally felt themselves not qualified to comment. Those that might have been qualified to comment are usually to be found as contributors to this book. The editors have assembled about sixty authors covering a wide range of aspects of aqueous phase catalysis in some fifty articles. The articles are of different depths and qualities, but for an outsider such as myself the book gives an excellent overview of the field. It also deals in an apparently informed fashion with industrial applications and with areas that academics have in the past to some extent ignored, such as safety.

The book is divided into major subsections, with a unifying commentary from the editors. These subsections are as follows. Basic Aqueous Chemistry deals with established organic reactions in water, then organometallic reactions in water, and finally the nature of some organometallic compounds in water. These last two subjects are somewhat briefer than the first, as might be expected. The next subsection is entitled Catalysts for Aqueous Catalysis. This deals with a range of materials, often derived from more conventional systems, that are stable to, and possibly soluble in, water. Thus, a lot of attention is given to water-soluble phosphines, such as sulfonated phosphines and phosphines carrying anionic groups, to immobilised ligands, and to surfactants. The next subsection is entitled Catalyses in Water as a Special Unit Operation. This has an emphasis on application and seems to

provide an easy first introduction to the subject. There then follows a short subsection called Aqueous Catalysts for Environment and Safety, which is not really a rallying cry so much as a brief description of problems and of how the OXO reaction has been advantageously adapted using water to improve its safety and environmental aspects.

The meat of the book then follows. About half the content is devoted to Typical Reactions such as hydroformylation, reactions of olefins and hydrogenation and hydrogenolysis. This is well documented but also very dense. It is easier to dip into it for specific information rather than to read it at a sitting. I found it interesting and it will undoubtedly be of value to those starting in these areas. Finally there is a subsection called Other Biphasic Concepts, which is not an illuminating title, especially as it deals with non-aqueous ionic liquids as well as the SHOP process and fluoros phases. The final subsection, called What Should be Done in the Future, courts danger. The future is always a mysterious country, and the editors might have been better advised to omit it, or at least to add a question mark to the title. However, it is only some 13 pages and it does not affect the value of the book.

This multi-author book is not, as are so many these days, the product of a conference. It represents a serious attempt to give a balanced and useful picture of a field of undoubted interest and great potential value. The editors are to be congratulated on assembling such a wide range of contributors who have described the industrial as well as the academic aspects of the subject. As a non-expert, I found it illuminating and I expect it to become a useful resource. I cannot imagine that many will buy it for their personal book collections, if only because it is rather expensive, but it should find a place on the shelves of chemistry and reference libraries.

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