

Book review

Homogeneous Catalysis. The Applications and Chemistry of Catalysis by Soluble Transition Metal Complexes, by G.W. Parshall, Wiley-Interscience, 1980, 240 pages, \$28.

As pointed out in the preface, the object of this book is to provide a balanced description of homogeneous catalytic reactions that are useful, either in the synthetic organic laboratory or in industry. Parshall has succeeded in doing a very thorough job in this respect. The result is a book that will appeal both to industrial and academic chemists interested in this ever-expanding area.

The first two chapters deal with the growth of homogeneous catalysis, particularly in the chemical industry, and with the relevant transition metal chemistry involved in such processes. The basic transition metal chemistry is treated at an understandable, but not trite, level and even newcomers to the field will find the material readily comprehensible. The chapter on olefin and diene reactions also contains a brief description of olefin-transition metal bonding. Subsequent chapters deal lucidly with olefin and diene polymerization, reactions of carbon monoxide, oxidation of olefins, arene and acetylene reactions, hydrocarbon oxidations and condensation polymerization. There is also a chapter on olefin metathesis and alkane activation, in which the possible involvement of carbene (alkylidene) complexes is succinctly discussed. Each chapter includes ample discussion of reaction mechanism be it well established or speculative, and points out areas requiring further investigation.

The final chapter deals with future trends in homogeneous catalysis. This thought-provoking section deals briefly with topics such as new feedstocks, hybrid catalysis (e.g. polymeranchored systems), the importance of selectivity in catalytic processes and possible new catalyst chemistry (e.g. photoactivation, metal cluster catalysis).

Parshall's objective of covering all the major industrial processes utilizing homogeneous catalysis appears to have been achieved. The more important synthetic laboratory procedures involving such chemistry are also covered. Many areas appropriate for further research become obvious on reading the text.

The book is well referenced with coverage running through the major part of 1979. Several of the chapters have a nice division between suggested general reading on the topic and the more specific references. One nice feature is the substantial number of references to the patent literature. The index is well planned and allows one to rapidly cross-reference any particular area of interest.

In summary, Parshall's book should find wide appeal, both to industrial and academic students. The material could also be readily included in advanced under-

graduate or graduate courses in this area. The book's reasonably modest price places it within the reach of the average chemist's pocket. Dr. Parshall deserves congratulations for his fine production.

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