ELSEVIER

Journal of Organometallic Chemistry 548 (1996) vii

Journal of Organometallic Chemistry

New directions in organometallic chemistry

It is now over forty years since the discovery of ferrocene – an event which is often taken as the starting point for the modern expansion of organometallic chemistry. The continual discovery of new applications means that the field is currently having a steadily increasing impact on other areas.

Catalysis continues to play a leading role. Metallocene polymerization has revolutionized the polymer industry and this area is currently the subject of intense patent activity. Asymmetric catalysis is also of increasing industrial interest since government regulations now call for the synthesis of one enantiomer of a drug molecule, rather than the racemic mixture. The rising concern about environmental problems will strongly benefit catalysis. Catalytic routes are often more atom-efficient than standard syntheses and more selective reactions are possible through catalysis; in either case, this means there are fewer byproducts for disposal. More sophisticated techniques are being developed for the separation and recovery of homogeneous catalysts.

Synthetic organic chemistry has benefited strongly from the influx of new concepts and methods provided by organometallic chemistry. Apart from catalytic reactions, the use of organolithium, -boron, -silicon or -phosphorus reagents is encountered in almost every new synthesis. Very early in my career I met a synthetic organic chemist who, on learning that I was an organometallic chemist, said "I tried an organometallic reaction once – a Grignard reaction. It didn't work.". Such a comment is inconceivable today.

Other growing applications are encountered in the materials area. Organometallic compounds are being used as precursors for solid state materials in metal–organic vapor deposition and sol–gel methods. The area of silicone polymers is a major industry.

In this Special Issue, I have gathered together some of the work on these and other novel aspects and applications of organometallic chemistry that may help lay the foundation for future conceptual advances and practical applications of importance. Of course, this group of papers is just a personal choice – other guest editors would come up with an entirely different list. The goal is to show the continuing vitality of the field and the rapidly expanding range of its applications.

Robert H. Crabtree
Yale University

0022-328X/96/$17.00 Published by Elsevier Science S.A.
PII S0022-328X(97)00055-7