



## Book Review

### **Polymeric Materials in Organic Synthesis and Catalysis**

Michael R. Buchmeiser (Ed.); Wiley–VCH, Weinheim, Germany, 2003, xxiii + 559 pages, ISBN 3-527-30630-7 (£29.95, €39.90)

Polymeric supports have been produced for many years using a wide variety of chemical processes and chemical reagents, and have been applied in synthetic methodologies, particularly catalytic reactions in many chemical and biological processes. Polymeric self-assembly is now being exploited to produce confined environments in reactors that can provide advantages in organic synthesis methodologies via catalysis of a variety of chemical reactions. Consequently, the design and application of polymeric supports for the production of fine chemicals and new intermediates is attracting considerable attention in a range of different areas in the chemical and life sciences industries, such as in combinatorial chemistry, drug discovery research, catalysis and biosynthesis. The scope of modern polymeric supports is therefore rapidly expanding, due to it offering new opportunities for the development of modern chemical productions and high-throughput screening methods in advanced manufacturing processes with simplified product recovery and purification.

This volume details the synthesis and characterisation of the materials used in polymer-supported synthesis and also discusses the use of novel functional polymer systems that are being applied in catalysis, modern organic synthesis, combinatorial chemistry and biosynthesis. The structure, morphology, physical formats of reagents and scavengers, reaction and polymerisation steps, analysis, control in organic synthesis and characterisation of polymeric materials and supports (such as polyethylene glycol, polyethylene oxide, polystyrene, etc.), is discussed. Individual chapters provide important contributions relevant to the ongoing progress and future success of polymer-mediated reactions in organic

synthesis, catalysis, and biosynthesis. Most chapters provide information on the novel strategies used to exploit new methods introduced in polymer synthesis, polymer characterisation and application of functional polymer supports. These include synthesis of structured polymer supports using living polymerisation and advanced graft co-polymerisation, the preparation of novel dendritic and hyperbranched carriers with very high loading, as well as the formation of structured particles, films, membranes, and monolithic systems.

Other topics covered include the monitoring and optimisation of reactions on solid supports and liquid phase systems, the development of polymer membrane reactors, the design of combinatorial libraries and the use of reagents (initiators, ligands, inducers, linkers, inhibitors, co-activators, scavengers, etc.) and polymer-bound reagents in organic multi-step syntheses. Several comprehensive overviews focus on the different aspects and practical applications of modern polymeric supports in organic syntheses and the emerging new opportunities of nanoreactor design by means of micellar catalysis and novel molecular nanoparticles.

In conclusion, this volume successfully brings together contributions from leading experts in order to highlight the outstanding advances and future potential of emerging strategies for the development of modern synthetic reactions based upon innovative polymeric supports. It is therefore highly recommended to all researchers with interests in these areas.

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