

## Volume Editors' Preface

Remarkable advancements in stereoselective synthesis have occurred over the past half-century. For decades, the Diels–Alder reaction was perhaps the only reaction providing reliably high and predictable stereoselectivity with broadly applicable efficacy. Subsequent developments in catalytic asymmetric hydrogenations and oxidations of alkenes, asymmetric hydroborations, and diastereoselective/enantioselective aldol reactions, among others, opened the floodgates to a host of highly tuned reactions that provided access to compounds in stunningly high diastereo- and enantioselectivities. This evolution was alluded to in the preface to **Houben–Weyl, Vol. E 21 (Stereoselective Synthesis)**, published in 1995), wherein Helmchen, Hoffmann, Mulzer, and Schaumann pointed to the enormous progress in stereoselectivity made in the 20 years prior to their extraordinary contribution.

In the intervening 15 years, one can see that further advancements have been, if anything, even more breathtakingly impressive. Whereas in the 1970s a 4:1 stereoselectivity in any given reaction might have been acceptable, if not remarkable, and in the 1990s the goal of 20:1 stereoselectivity was achieved in pockets of transformations of variable scope, in 2010 anything less than 20:1 stereoselectivity across a wide range of transformations and reacting partners is now decidedly unacceptable.

These many advancements called for an update that was timely, state-of-the-art, and focused on those modern methods likely to influence the course of organic synthesis for the foreseeable future. The result is **Stereoselective Synthesis**, a part of the **Science of Synthesis Reference Library**. **Stereoselective Synthesis** is a major reference work that critically reviews the status of the discipline and serves as a foundation to forge the future of the field. Although the original **Stereoselective Synthesis** focused largely on stoichiometric methods, the increasing significance of catalytic processes has transformed the field. This latest version of **Stereoselective Synthesis** reflects and highlights the stunning advancements in these many catalytic methods (metal-based, organocatalytic, or enzymatic), in addition to reemphasizing the importance of stoichiometric transformations.

Unlike other reference works, **Stereoselective Synthesis** is not a comprehensive review or treatise, but rather a critical selection of those synthetic methods that are viewed by distinguished experts as most significant. Typical or general experimental procedures for the methods have been carefully selected. In evaluating protocols for inclusion, the authors were asked to consider yields, selectivities, breadth of applicability, atom economy, robustness, scalability, and environmental impact. The result is a snapshot of the best, most useful synthetic methods available for constructing a wide range of important organic substructures.

The organization of **Stereoselective Synthesis** is based on synthetic methods, which are arranged according to the type of reaction. The contributions have been divided into three volumes. Volume 1 considers stereoselective reactions of carbon–carbon double bonds. In the second volume, stereoselective reactions of carbonyl and imine groups have been collected. The third volume discusses pericyclic reactions, cross-coupling reactions, and reactions taking place by C–H and C–X activation. Each chapter within these volumes covers a specific synthetic method.

The Editors have benefited tremendously from the expertise and dedicated efforts of all of the authors who have devoted their valuable time and energy to participate in this unique contribution. We thank all of these individuals, as well as the editorial staff in Stuttgart, for the outstanding efforts they have made throughout the entire publication process, making **Stereoselective Synthesis** a gold standard in Thieme's **Science of Synthesis** reference series.

**Volume Editors**

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