Introduction

The developments in organic synthesis in recent years have been as dramatic as any that have occurred in laboratory sciences. The chemistry horizon has expanded and consolidated in such a way that one needs only mention a few terms to understand that chemical systems that did not exist roughly twenty years ago have now become a part of repertoire of synthetic organic chemistry pertaining to various research endeavours. The list of such terms would include the name reactions, organometallics, organocatalysis, oxidation, reduction, C–H activation, NHC, biocatalysis, *etc*. Surprisingly, the advances to the manipulations of these reaction techniques in a so called ''non-hazardous/safer/greener'' manner for the manufacturing of products of various interests have been unsuccessful in materializing a way forward for a sustainable world. The purpose of this book is to sensitize the chemistry fraternity to the idea that the usage of hazardous reagents in manufacturing of goods no longer fits in any business, environmental or technical propositions. It is rather mandatory or unavoidable to find alternates for all reported legendary yet hazardous reagents meant for or currently used for material production. These reagents, their by-products and demanding process conditions have found to pose a high degree of challenges in terms of safety and occupational exposure to the people (especially those are in the vicinity of operation) and imbalances to the ecosystem. This book features eight chapters as well as the foreword. Chapter I, entitled Introduction to Hazardous Reagent Substitution in the Pharmaceutical Industry, talks about substitution of hazardous reagents with less or non-hazardous ones as one of the most essential parts of risk management in the work place, whether it is a research and development or a manufacturing set-up. Chapter II, entitled Recyclability of Reagents, emphasizes the reduction and disposal

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of the reagents meaningfully. Chapter III, entitled Recoverable Polymer-Supported DMAP Derivatives, elaborates on the significance of polymer-supported catalysis for chemists to recycle the reagents and reduce the overall carbon footprint of synthesis. Chapter IV, entitled Synthesis of Atorvastatin, describes the switch of a set of hazardous reagents to a less hazardous reagent system from first- to third-generation synthesis. Chapter V, entitled Synthesis of Raloxifene, talks about the evolutionary trend of reagent switching as newer generations of synthesis took precedence over time. Chapter VI, entitled Synthesis of Montelukast, encompasses the use of less hazardous reagents and scalable conditions in process chemistry routes. Chapter VII, entitled Development of a Safe, Scalable, Azide-Free Synthesis of 1-Aryl-1*H*-Tetrazoles using Diformylhydrazine, details the development of an improved and more efficient, safe process for the synthesis of tetrazoles. Finally, Chapter VIII, entitled New Directions From Academia, summarizes the scope and limitations of industry-academia collaborative research.

This book attempts to provide a perspective of finding non- or less-hazardous reagents for the hazardous reagents in practice which can be employed not just in the hitherto known synthesis but that can also be adopted for the synthesis of new entities.

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