



Modern Supramolecular Gold Chemistry

Gold chemistry is flourishing. Just 30 years ago, almost all applications of gold were based on the bulk metal, and the renaissance in gold chemistry was just beginning with the pioneers, notably in Germany, Russia, and Spain. Gold was thought to be inactive in catalysis whereas, today, both heterogeneous catalysis by nanoparticulate gold and homogeneous catalysis by gold(I) and gold(III) molecular complexes are hot areas of research. The discovery of ways to effect microcontact printing on gold and to make and functionalize gold nanoparticles, typically using thiolate groups to protect the surface, has encouraged interdisciplinary materials research by experts in inorganic, physical, and organic chemistry. The optical properties of gold compounds promise applications in photonic devices while the biological properties have already found applications in medicine. It is this happy conjunction of new and potential applications together with exciting academic discoveries in gold chemistry that has led to the current upsurge in research activity. This book gives a timely summary of recent advances. It focuses particularly on the supramolecular chemistry of gold, but it gives broader coverage too.

The editor has assembled a distinguished group of chemists, mostly associated with the Materials Science Institute of Aragon and the universities of Zaragoza and La Rioja, and they ably represent the renowned Spanish school of gold chemistry. After an introduction by the editor, M. C. Gimeno gives a fine overview of the chemistry of gold. Many of the unique properties of gold can be traced back to relativistic effects and the relevant theoretical basis is outlined along with key examples. The attraction between closed shell gold(I) centers is called *auriphilicity*, and it has a most important effect on the supramolecular chemistry of gold compounds. The $\text{Au}\cdots\text{Au}$ attraction has a strength similar to a hydrogen bond, and it can control the higher order structures of gold compounds and stabilize either homonuclear or heteronuclear gold clusters. Similar $\text{Au}\cdots\text{M}$ attractions can be formed with many metals and nonmetals, and these effects are described in more detail in subsequent chapters. The supramolecular chemistry involving gold-gold attractions is described by O. Crespo in chapter 2, and the larger gold clusters and nanoparticles are discussed by E. J. Fernandez and M. Monge in chapter 3. C. Sylvestru describes the diverse supramolecular chemistry of compounds with $\text{Au}\cdots\text{M}$ and $\text{Au}-\text{M}$ bonds in chapter 4. The supramolecular architecture of gold compounds containing all types of secondary bonds, including the above types often

in combination with hydrogen bonds, π stacking, $\text{Au}\cdots\text{S}$, and $\text{Au}\cdots\text{Cl}$ secondary bonds are described by M. E. Olmos in chapter 5. The luminescence of supramolecular gold compounds is discussed by J. M. Lopez-de-Luzuriaga in chapter 6, while liquid-crystalline gold compounds are described by M. Bardaji in chapter 7. A fine chapter on applications of gold compounds in catalysis, contributed by M. C. Blanco Ortiz, does not fit the supramolecular chemistry theme but is nevertheless essential in a modern text on gold chemistry.

Overall, the book gives a fine overview of current research in gold chemistry and conveys the excitement and opportunities in the field. It can be recommended for researchers and students in gold chemistry and technology as well as to all chemists interested in an overview of current applications and properties of gold and its chemical compounds. For those interested in supramolecular gold chemistry, this book will be a particular delight.

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The Power of Functional Resins in Organic Synthesis

Since the discovery by Bruce Merrifield that the attachment of substrates to a polymeric support can significantly improve the efficiency of organic synthesis, which earned him a Nobel Prize, the use of solid-phase organic synthesis (SPOS) or solid-supported reagents has become an important tool in the synthesis of organic molecules. Despite its conceptual elegance, the practitioners in the laboratory know that the use of polymeric resins in organic synthesis also has its intricacies and challenges. While previous books and articles have discussed certain aspects of this discipline, Tulla-Puche and Albericio in *The Power of Functional Resins in Organic Synthesis* present for the first time a much awaited comprehensive review of this field. Twenty-one chapters, written by the leading scientists in this area, provide a complete coverage of all the applications of functional resins in organic synthesis.

The book is structured in five major parts. The first and shortest one contains chapters about molecularly imprinted polymers and nanoparticles functionalized with bioactive molecules. The second part, with 160 pages, provides an excellent update about solid-supported reagents and scav-



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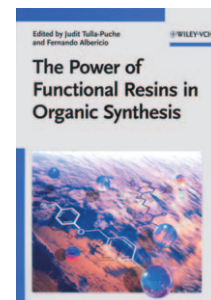
engers, complementing the classic and comprehensive review by Ley and co-authors in 2000. The reader will benefit from the fact that the material in this section is organized according to applications, such as "Oxidizing/Reducing Agents" or "Metal Scavengers". The next 140 pages that form the third part are devoted to the important subject of resin-bound catalysts in their various forms (organo-catalysts, transition metals, chiral auxiliaries, enzymes), then the fourth part deals with resins and linkers used in SPOS, which are discussed in four excellent and well-structured chapters. The book is complemented by concise but very instructive articles about the solid-phase synthesis of peptides, oligonucleotides, oligosaccharides, and natural products, in which the role of the support is given special attention. As in most multi-author books the quality, style, and depth of the individual chapters vary, but the level of all chapters is in general very high, and they will please different readers depending on their interests.

This book offers an important service for the organic synthesis community, as it allows access to information that is notoriously difficult to research, since there are problems in trying to use common databases for structure-based searches of polymer-bound reactions or reagents. A 22-page index allows convenient access to the enormous amount of information in this book, which contains more than 2500 references covering the literature up to the year 2007. The editors have succeeded in providing an authoritative summary of the use of functional resins in organic synthesis. The book impresses by the enormous range of topics that are discussed. Every chemistry library in academia or industry should own a copy of this book.

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