Dynamic Combinatorial Chemistry

This textbook on dynamic combinatorial chemistry (DCC), edited by Ben Miller, represents the first on this subject area. DCC is a relatively new research area that draws inspiration from a number of different fields including supramolecular chemistry and Darwinian evolution. Building upon the concepts of being able to perform template-directed synthesis under thermodynamic control, DCC relies on the generation of libraries of compounds under reversible conditions that, when placed under a selection pressure, amplify the desired library member(s).

DCC is perceived to have enormous potential in drug, catalyst, and materials discovery and optimization and so a textbook after around 15 years is fully warranted. A number of comprehensive reviews on DCC have appeared during the last few years that cover the majority of the material described in the book—the analogy to a review is natural with a "first text", however what this book does offer is a well-structured and balanced treatment of the field up to around 2008 with 8 chapters on basics of DCC (chapter 1), DCC in medicinal chemistry, specifically proteins and nucleic acids (chapters 2 and 3), self-sorting (chapter 4), enantioselective DCC (chapter 5), dynamic combinatorial resolution (chapter 6), analytical methods for lead discovery using DCC (chapter 7), and DCC in materials chemistry (chapter 8).

What I particularly enjoyed was the perspective given by the authors of each individual chapter; although there is some inevitable duplication of material, the thinking that has gone into the development of different facets of the field is nicely brought out in a manner that is impossible in a comprehensive review and seldom occurs in reference texts. Similarly, the subdivision of the significant quantity of primary literature into individual chapters makes it easy to digest and access distinct themes. The text is well written and no key material is omitted although in places there is excessive presentation of experimental data. The diagrams used throughout the book are simple, effective, and informative.

The primary strength of this book is as a reference text for research laboratories although the interested final-year undergraduate might also find the book useful. Newcomers to DCC would also find the textbook an accessible introduction. In summary, this is an excellent and highly recommended textbook.

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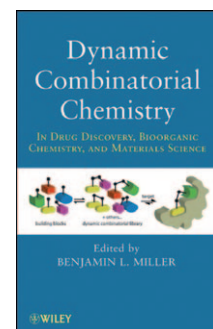
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