

# Elements Of Synthesis Planning



## Synopsis

Synthesis is at the core of organic chemistry. In order for compounds to be studied—be it as drugs, materials, or because of their physical properties—they have to be prepared, often in multistep synthetic sequences. Thus, the target compound is at the outset of synthesis planning. Synthesis involves creating the target compound from smaller, readily available building blocks. Immediately, questions arise: From which building blocks? In which sequence? By which reactions? Nature creates many highly complex “natural products” via reaction cascades, in which an assortment of starting compounds present within the cell is transformed by specific (for each target structure) combinations of modular enzymes in specific sequences into the target compounds [1, 2]. To mimic this efficiency is the dream of an ideal synthesis [2]. However, we are at present so far from realizing such a “one-pot” operation that actual synthesis has to be achieved via a sequence of individual discrete steps. Thus, we are left with the task of planning each synthesis individually in an optimal fashion. Synthesis planning must be conducted with regard for certain specifications, some of which are due to the structure of the target molecule, and some of which relate to external parameters such as costs, environmental compatibility, or novelty. We will not consider these external aspects in this context. Planning of a synthesis is based on a pool of information regarding chemical reactions that can be executed reliably and in high chemical yield.

## Book Information

Paperback: 227 pages

Publisher: Springer; 2009 edition (January 22, 2009)

Language: English

ISBN-10: 3540792198

ISBN-13: 978-3540792192

Product Dimensions: 6.1 x 0.6 x 9.4 inches

Shipping Weight: 12.6 ounces (View shipping rates and policies)

Average Customer Review: 5.0 out of 5 stars 2 customer reviews

Best Sellers Rank: #320,188 in Books (See Top 100 in Books) #27 in Books > Science & Math > Chemistry > Clinical #331 in Books > Science & Math > Experiments, Instruments & Measurement > Methodology & Statistics #387 in Books > Medical Books > Medicine > Internal Medicine > Pathology > Clinical Chemistry

## Customer Reviews

From the reviews: “The text is recommended for those with a strong foundation in organic

chemistry. | The book would be quite helpful for those who plan syntheses on a regular basis | . The text is a useful addition to the library of any synthetic organic chemist or to select undergraduate and graduate curricula. | Readers will certainly learn more about the chemistry, the logic, and the art of planning a novel synthesis and contributing to a vast and interesting field. • (Bridget G. Trogden, Journal of Chemical Education, Vol. 88, 2011) From an undergraduate learning perspective the concept of synthesis planning or retrosynthesis can appear to be a daunting prospect. The idea of being asked to think backwards for many is a big leap, despite the vast majority already possessing a well-stocked chemical toolbox and being more than capable to explain a multitude of complex mechanistic transformations. In Elements of synthesis planning, a reworked translation of his original German text, Reinhard Hoffmann sets out to 'demystify' the art of synthetic planning, which is an essential and vital skill practised every day throughout the worldwide organic chemistry community. In 12 clear and logical chapters, Hoffmann takes the reader from the basic concepts of retrosynthesis (use of synthons, identifying key bond disconnections, unmasking symmetry elements etc) to dedicated chapters on the application of chiral building blocks, strategic planning of complex synthetic sequences and the synthesis of polycyclic ring systems. In the final chapter, all these concepts are brought together to elegantly compare several individual approaches to one of five representative natural products, highlighting the tactics and strategies employed. As such, this text would ideally complement an advanced undergraduate course on complex organic synthesis, which is beyond the level of most standard organic chemistry textbooks. It would also prove highly useful to postgraduates at the beginning of their research careers in synthesis to inspire creativity and maybe put their ideas into practice. Gordon Florence, Chemistry World, 2009, 6(8), p. 63

This was a wonderful book, but very difficult. The book is well written, and well presented.....However....it often shows synthesis where several steps were left out. The book is not student-friendly, but helpful to the synthetic organic chemist....at the Ph.D level. I would say that this is the toughest book on the planet.....and I have yet to master all of it.....but will one day in the future ! Dr. Jim Romano Co-CEO Orgoman.com/Author of DAT DESTROYER book and Organic Odyssey

Excellent book for the experienced Synthetic Chemist.

[Download to continue reading...](#)

Handbook of Reagents for Organic Synthesis: Reagents for Heteroarene Synthesis (Hdbk of

Reagents for Organic Synthesis) Elements of Synthesis Planning Advanced Organic Chemistry:  
Part B: Reaction and Synthesis: Reaction and Synthesis Pt. B The Organic Chemistry of Drug  
Synthesis, Volume 3 (Organic Chemistry Series of Drug Synthesis) Landmarking and Segmentation  
of 3D CT Images (Synthesis Lectures on Biomedical Engineering Synthesis Lectu) Essential  
Elements for Band - Book 2 with EEi: Flute (Essential Elements 2000 Comprehensive Band  
Method) Concert Favorites Vol. 1 - Trombone: Essential Elements 2000 Band Series (Essential  
Elements 2000 Band Method) Essential Elements for Strings - Book 1 (Original Series): Double  
Bass (Essential Elements for Strings, Bk 1) Essential Elements for Strings - Book 1 (Original  
Series): Viola (Essential Elements Comprehensive String Method) Essential Elements Movie  
Favorites for Strings: Viola (Essential Elements for Strings) Essential Elements: A Comprehensive  
Band Method, Book 2 - Bb Clarinet (Essential Elements Method) Essential Elements Movie  
Favorites: Bb Trumpet (Essential Elements Band Method) The Beatles: Essential Elements for Band  
Correlated Collections Tuba (Essential Elements Band Method) Essential Elements For Jazz Drums  
Bk/online media (Instrumental Jazz) (Essential Elements for Jazz Ensemble) Essential Elements  
Movie Favorites: Eb Alto Saxophone (Essential Elements Band Method) Photographic Card Deck of  
The Elements: With Big Beautiful Photographs of All 118 Elements in the Periodic Table Delivering  
the Sermon: Voice, Body, and Animation in Proclamation (Elements of Preaching) (Elements of  
Preaching) The Elements of Polymer Science and Engineering, Third Edition (Elements of Polymer  
Science & Engineering) Elements of Polymer Science & Engineering, Second Edition: An  
Introductory Text and Reference for Engineers and Chemists (The Elements of Polymer Science  
and Engineering) Structural Elements for Architects and Builders: Design of Columns, Beams, and  
Tension Elements in Wood, Steel, and Reinforced Concrete, 2nd Edition

[Contact Us](#)

[DMCA](#)

[Privacy](#)

[FAQ & Help](#)