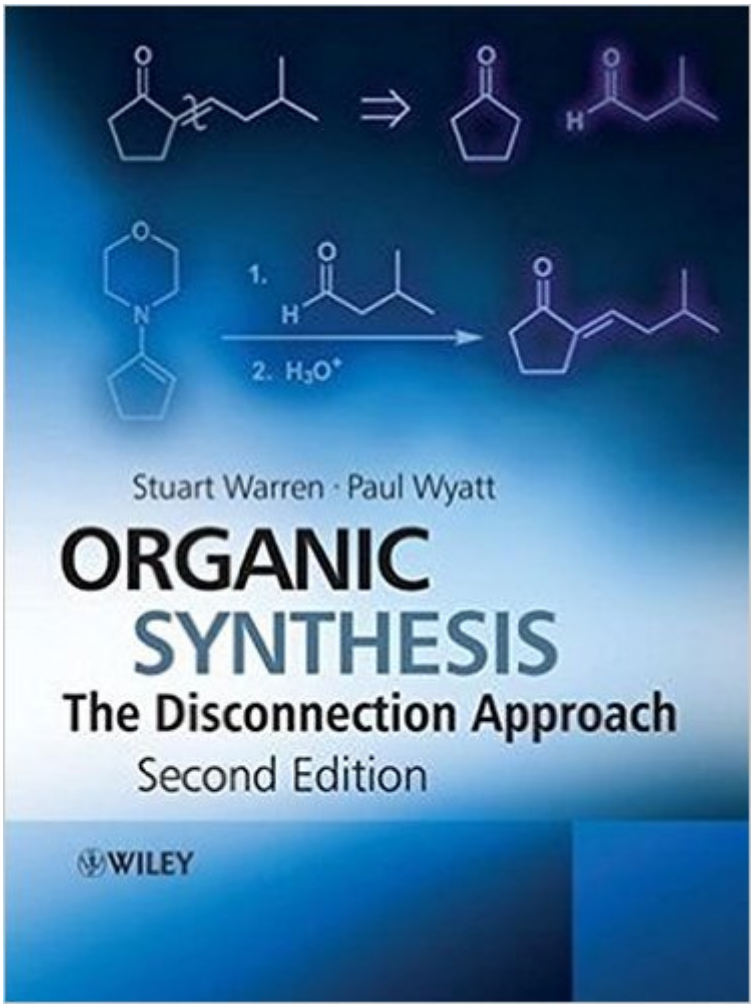
Organic Synthesis: The Disconnection Approach



Synopsis

One approach to organic synthesis is retrosynthetic analysis. With this approach a chemist will start with the structure of their target molecule and progressively cut bonds to create simpler molecules. Reversing this process gives a synthetic route to the target molecule from simpler starting materials. This â œdisconnectionâ • approach to synthesis is now a fundamental part of every organic synthesis course. Organic Synthesis: The Disconnection Approach, 2nd Edition introduces this important technique, to help students to design their own organic syntheses. There are forty chapters: those on the synthesis of given types of molecules alternate with strategy chapters in which the methods just learnt are placed in a wider context. The synthesis chapters cover many ways of making each type of molecule starting with simple aromatic and aliphatic compounds with one functional group and progressing to molecules with many functional groups. The strategy chapters cover questions of selectivity, protection, stereochemistry, and develop more advanced thinking via reagents specifically designed for difficult problems. Examples are drawn from pharmaceuticals, agrochemicals, natural products, pheromones, perfumery and flavouring compounds, dyestuffs, monomers, and intermediates used in more advanced synthetic work. Reasons for wishing to synthesise each compound are given. This second edition has been fully revised and updated with a modern look. Recent examples and techniques are included and illustrated additional material has been added to take the student to the level required by the sequel, â œOrganic Synthesis: Strategy and Controlâ •. Several chapters contain extensive new material based on courses that the authors give to chemists in the pharmaceutical industry. Organic Synthesis: The Disconnection Approach, 2nd edition provides a full course in retrosynthetic analysis for chemistry and biochemistry students and a refresher for organic chemists working in industry and academia.

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Customer Reviews

Warren’s Organic Synthesis-Disconnection Approach focuses on retrosynthetic analysis in organic synthesis. Some of the central concepts introduced in this strategy book are synthons, target molecule, FGI (functional group interconversion), disconnection, and reagent.Synthons: an idealized fragment, usually a cation or an anion, resulting from a disconnection. Synthons may or may not be an intermediate in the corresponding reaction.Disconnection: the reverse operation to a reaction. The imagined cleavage of a bond to "break" the molecule into possible starting materials.Functional group interconversion: the process of converting one functional group into another by substitution, addition, elimination, oxidation, or reduction, and the reverse operation used in retrosynthetic analysis.Reagent: Warren introduces a formal and rigid definition of reagent in this book. Reagent is a compound used in practice for a synthon.Warren’s treatise of organic synthesis emphasizes visualizing and choosing not only the most obvious but the most efficient disconnection (retrosynthesis) in synthesizing a target molecule. The book is set up in a fashion such that synthetic strategies and organic reactions are presented in alternating chapters. Strategies aim to enforce tricks and concepts of organic synthesis like stereoselectivity, control of regiochemistry and stereochemistry, control of carbonyl condensation, order of events in synthesis, rearrangements, use of ringed molecules. Reaction chapters present some of the most significant reactions in organic synthesis, with an emphasis of those involve carbon-carbon formation.

Warrens book "Organic Synthesis: The Disconnection Approach" serves as an excellent bridge between the elementary education received at the undergraduate level and the more complex problems faced by synthetic practitioners. Strictly speaking, the book does not stray much beyond the complement of reactions that are learned at the undergraduate level, so much of the chemistry should be familiar to anyone having taken a two semester course. The strength of this rather short book lies in its ability to identify synthetic challenges by analyzing the retrosynthetic disconnections that create them.Chapters alternate between the identification of a retrosynthetic disconnection and a discussion of a synthetic strategy. The book is valuable in that it distinguishes seemingly related compounds, such as 1,3-dicarbonyl compounds and 1,4-dicarbonyl compounds, and exposes the need for different synthetic strategies in each case - normal synthon polarity in the first case and

inverse, or "umpolung", polarity in the second. Identifying relationships between functional groups in a molecule is presented as a means to determining possible strategies for its synthesis. Other important topics that are addressed include synthetic planning (order of events), stereochemistry, ring formation, reconnection, heterocycles, radical species, and many others.Overall, students should expect to gain competency in the retrosynthetic analysis of molecules of moderate complexity. The book overlooks many modern day methods, but prepares students well for a graduate level synthesis course that would include such methods and gives students a better appreciation for the problems these new methods address. In my opinion, it is one of the best introductions available.