



Fischer Indole Synthesis

Earl Eugene Fisher



Fischer Indole Synthesis:

The Fischer Indole Synthesis Brian Robinson, 1982 A comprehensive survey of the Fischer indole synthesis Emphasizes three main features of the reaction its development the clarification of its mechanism and the utilization of it and its extensions in the synthetic process Covers the investigations of the reaction from its discovery in 1883 through the last published report in 1981 **Studies on the Fischer Indole Synthesis** Earl Eugene Fisher, 1948 *Kinetic Investigations of the Fischer Indole Synthesis* Paulus Isaac Th.. Scheltus, 1959

Name Reactions in Heterocyclic Chemistry Jie Jack Li, 2004-12-13 Covers important name reactions relevant to heterocyclic chemistry The field of heterocyclic chemistry has long presented a special challenge for chemists Because of the enormous amount and variety of information it is often a difficult topic to cover for undergraduate and graduate chemistry students even in simplified form Yet the chemistry of heterocyclic compounds and methods for their synthesis form the bedrock of modern medicinal chemical and pharmaceutical research Thus there is a great need for high quality up to date and authoritative books on heterocyclic synthesis helpful to both the professional research chemist as well as the advanced student *Name Reactions in Heterocyclic Chemistry* provides a one stop repository for this important field of organic chemistry The primary topics include three and four membered heterocycles five membered heterocycles including indoles furans thiophenes and oxazoles six membered heterocycles including quinolines isoquinolines and pyrimidines and other heterocycles Each name reaction is summarized in seven sections Description Historical perspective Mechanism Variations and improvements Synthetic utility Experimental References Authored by a team of world renowned contributors some of whom have discovered the very reactions they describe *Name Reactions in Heterocyclic Chemistry* represents a state of the art resource for students and researchers alike

Kinetic Investigations of the Fischer Indole Synthesis Paulus Isaac Theodoor Scheltus, 1959 **Towards an Efficient Fischer Indole Synthesis of 3,2'-biindoles** Joseph K. Kubert, Dartmouth College. Department of Chemistry, 2010

II. Studies on the Fischer Indole Synthesis John George Wallace, 1950 **A Study of the Fischer Indole Synthesis** Frank P. Robinson (Jr.), 1964 With the aim of gaining evidence in support of the proposed dienone imine intermediate in the Fischer indole synthesis several attempts were made to form a Diels Alder adduct of this intermediate by the thermal cyclization of simple phenylhydrazones in the presence of the dienophiles maleic anhydride and tetracyanoethylene Even though cyclization of the phenylhydrazones to the corresponding indoles occurred under the conditions used no adduct could be isolated With maleic anhydride as the dienophile hydrazide formation occurred instead Attempts to form such an adduct by cyclizing the diacetyl derivative of methyl ethyl ketone phenylhydrazone in the presence of maleic anhydride were also unsuccessful The attempted preparation of the diacetyl derivatives of 2,6-dimethylphenylhydrazones led to mono and diacylated 2,6-dimethylphenylhydrazines instead An improved technique for the identification of these latter compounds was devised This method consists of hydrogenolysis of the N-N bond of the acylated hydrazines with Raney nickel and hydrazine

followed by isolation and identification of the resulting fragments Finally when N methyl 2 6 dichlorophenylhydrazine was prepared and condensed with cyclohexanone under mild room temperature conditions two indoles were isolated and their structures proven by unambiguous syntheses The formation of these products is explained in terms of the proposed dienone imine intermediate This also represents the first known case of such a facile non catalytic Fischer indole synthesis

Studies on the Direction of Cyclization in the Fischer Indole Synthesis William Neal Schinske, 1973 **Reactive Intermediates in the Fischer Indole Synthesis** Dorothy M. Walker, 1967 **The Fischer Indole Synthesis with Substituted Hydrazines** Harlan Patrick Hamlow, 1962 **Stereochemical Effects on the Direction of Cyclization in the Fischer Indole Synthesis** Raymond A. Lohr, 1977 **A Mechanistic Study of the Fischer Indole Synthesis** Gurdip Singh Bajwa, 1968

To obtain the dienone imine intermediate proposed in the Robinson mechanism of the Fischer indole synthesis the reaction of cyclohexanone with alkyl 2 6 dialkylphenylhydrazine and its hydrochloride was studied When the above reactants were heated in refluxing dry benzene and water removed azeotropically 8 9 dialkyl 1 2 3 4 tetrahydrocarbazole could be obtained in good yield Only two other products could be isolated from this reaction They were ammonium chloride and alkylamine hydrochloride The latter arose through the elimination of the alkyl group at the nitrogen atom and not from the alkyl group attached to the aromatic ring of the hydrazine Although neither the enehydrazine nor the dienone imine intermediate could be isolated the products of the reaction could be explained only through their intermediacy When the reaction of N methyl 2 6 dimethylphenylhydrazine with cyclohexanone was conducted at room temperature through the azeotropic removal of water under vacuum an oil was obtained which gave an indication of the presence of the expected enehydrazine in it All attempts to isolate this enehydrazine in pure form were unsuccessful Further when this oil was treated in benzene with maleic anhydride no Diels Alder adduct of the expected dienone imine could be isolated The inability to isolate or trap the dienone imine intermediate was ascribed to the presence of an enolizable hydrogen at a carbon atom symbol to the imine carbon of the former cyclohexanone ring When such an enolizable hydrogen in the dienone imine intermediate was eliminated by the use of isobutyraldehyde and the latter allowed to react with N methyl 2 6 dimethylphenylhydrazine hydrochloride a stable dienone imine hydrochloride was obtained This could be purified and converted to the free dienone imine This dienone imine reacted with tetracyanoethylene and maleic anhydride to give the reactions of secondary amines rather than to form the corresponding Diels Alder adducts The reaction with acetyl chloride gave N acetylation However this dienone imine could not be converted to the corresponding indole When a mixture of propionaldehyde and N methyl 2 6 dimethylphenylhydrazine hydrochloride was heated in refluxing dry benzene for 20 hours 1 3 7 trimethylindole 31% was obtained The latter was contaminated with 3 7 dimethyl indole 9% When the above reactants were heated in refluxing dry benzene for only 10 12 minutes a solid dienone imine hydrochloride containing isomeric contaminants was obtained When this material was again heated in refluxing dry benzene for 19 hours the reaction mixture

gave a 35% yield of 1,3,7-trimethylindole also contaminated with 3,7-dimethylindole 9% The isolation of a dienone imine and its conversion to the corresponding indole supports the mechanism proposed by Robinson for the Fischer indole synthesis

Organic Reactions Stereochemistry And Mechanism (Through Solved Problems) P S Kalsi, 2007 The Book Provides A Self Study Of Different Topics Of Organic Chemistry Via Problem Solving The Present 4th Edition Has Been Completely Rewritten According To The Organic Chemistry Syllabus Of The Net CSIR Examination This Necessitated The Deletion Of Several Topics From The Third Edition And Incorporation Of New Ones Emphasis Has Been Laid On A Variety Of New Reactions Name Reactions Reagents In Organic Synthesis And Incorporation Of Their Knowledge In The Entire Coverage Of Organic Chemistry In A Unique Way A Thorough Study Of The Book Is Expected To Help The Student To Excel Not Only In The University Examination Including The Net Examination But Also In His Learning Of Various Topics And Before Interview Boards Several Topics Like Aromaticity Pericyclic Reactions And Heterocyclic Chemistry Have Now Been Brought Up To Date And The Material Provided Is Complete In Itself The Presentation Has Been So Designed So As To Thread Through The Entire Organic Chemistry By The Application Of The Knowledge Learnt In One Topic To Newer Situations In Other Topics The Present Revised Edition Also Includes Numerous Important Developments Since The Third Edition Of The Book Was Published

Progress in Heterocyclic Chemistry Gordon Gribble, J. Joule, 2011-07-29 The eighteenth annual volume of *Progress in Heterocyclic Chemistry* covers the literature published during 2005 on most of the important heterocyclic ring systems This volume opens with two specialized reviews The first by Heui Yeon Kim and Cheon Gyu Cho covers The Diels Alder cycloadditions of 3,5-dibromo-2-pyrone and its derivatives The second by Jean Luc Girardet and Stanley Lang discusses Recent developments in the chemistry of nucleosides The remaining chapters examine the 2005 literature on the common heterocycles in order of increasing ring size and the heteroatoms present References are incorporated into the text using the journal codes adopted by *Comprehensive Heterocyclic Chemistry* and are listed in full at the end of each chapter Included in the index are systematic heterocyclic ring system names Includes new contributions from experts in the field Covers literature published during 2005 on most of the important heterocyclic ring systems Presents two specialized reviews

Heterocyclic Chemistry John A. Joule, Keith Mills, 2010-06-15 This book has so closely matched the requirements of its readership over the years that it has become the first choice for chemists worldwide Heterocyclic chemistry comprises at least half of all organic chemistry research worldwide In particular the vast majority of organic work done in the pharmaceutical and agrochemical industries is heterocyclic chemistry The fifth edition of *Heterocyclic Chemistry* maintains the principal objective of earlier editions to teach the fundamentals of heterocyclic reactivity and synthesis in a way that is understandable to second and third year undergraduate chemistry students The inclusion of more advanced and current material also makes the book a valuable reference text for postgraduate taught courses postgraduate researchers and chemists at all levels working with heterocyclic compounds in industry Fully updated and expanded to reflect important 21st

century advances the fifth edition of this classic text includes the following innovations Extensive use of colour to highlight changes in structure and bonding during reactions Entirely new chapters on organometallic heterocyclic chemistry heterocyclic natural products especially in biochemical processes and heterocycles in medicine New sections focusing on heterocyclic fluorine compounds isotopically labeled heterocycles and solid phase chemistry microwave heating and flow reactors in the heterocyclic context Essential teaching material in the early chapters is followed by short chapters throughout the text which capture the essence of heterocyclic reactivity in concise resum s suitable as introductions or summaries for example for examination preparation Detailed systematic discussions cover the reactivity and synthesis of all the important heterocyclic systems Original references and references to reviews are given throughout the text vital for postgraduate teaching and for research scientists Problems divided into straightforward revision exercises and more challenging questions with solutions available online help the reader to understand and apply the principles of heterocyclic reactivity and synthesis

The Chemistry of Indoles Richard Sundberg, 2012-12-02 Organic Chemistry Volume 18 The Chemistry of Indoles discusses the chemistry of indole derivatives This book explores the potent biological activity of several indole derivatives and explains the structure of indole alkaloids Organized into 10 chapters this monograph starts with an overview of the most important types of reactions of the indole ring on a mechanical basis This text then proceeds to review the methods of synthesizing indoles and describes the oxidations and rearrangements of indole derivatives Other chapters explore the special features of the synthesis and reactivity of hydroxyindoles acylindoles and aminoindoles This book discusses as well the properties of carboxyl groups which is substituted on the benzenoid ring of the indole nucleus that is typical of aromatic carboxylic acids The final chapter deals with the certain classes of indoles that are found in nature Chemists researchers and readers interested in the chemistry of indoles will find this book extremely useful Advances in Heterocyclic Chemistry Eric F.V. Scriven, Christopher A. Ramsden, 2023-02-07 Advances in Heterocyclic Chemistry Volume 139 the latest release in this definitive series on the field of heterocyclic chemistry combines descriptive synthetic chemistry and mechanistic insights to yield an understanding on how chemistry drives the preparation and useful properties of heterocyclic compounds Topics in this new release include Application of the Fischer indole synthesis in medicinal chemistry Oxindole Synthesis via C H Activation Methods Ring Closing Metathesis in the Synthesis of Fused Indole Structures Synthesis of fuller heterocycles The Literature of Heterocyclic Chemistry Part XX 2020 and Heterocyclic Zwitterions Based on Coupled Polymethines Presents what is considered to be the definitive serial in the field of heterocyclic chemistry Serves as the go to reference for organic chemists polymer chemists and many biological scientists Provides the latest comprehensive reviews written by established authorities in the field Combines descriptive synthetic chemistry and mechanistic insights to enhance understanding on how chemistry drives the preparation and useful properties of heterocyclic compounds **Clay Mineral Catalysis of Organic Reactions** Benny K.G Theng, 2018-07-27 The book provides insight into the working of clays and clay minerals in speeding

up a variety of organic reactions Clay minerals are known to have a large propensity for taking up organic molecules and can catalyse numerous organic reactions due to fine particle size extensive surface area layer structure and peculiar charge characteristics They can be used as heterogeneous catalysts and catalyst carriers of organic reactions because they are non corrosive easy to separate from the reaction mixture and reusable Clays and clay minerals have an advantage over other solid acids as they are abundant inexpensive and non polluting *Progress in Heterocyclic Chemistry* Gordon W. Gribble, John A. Joule, 2011-11-07 *Progress in Heterocyclic Chemistry* PHC is an annual review series commissioned by the International Society of Heterocyclic Chemistry ISHC Volumes in the series contain both highlights of the previous year s literature on heterocyclic chemistry and articles on emerging topics of particular interest to heterocyclic chemists The chapters in Volume 23 constitute a systematic survey of the important original material reported in the literature of heterocyclic chemistry in 2010 As with previous volumes in the series Volume 23 appraises academic industrial chemists and advanced students of developments in heterocyclic chemistry in a convenient format Covers the heterocyclic literature published in 2010 Includes specialized reviews Features contributions from leading researchers in their fields

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Table of Contents Fischer Indole Synthesis

1. Understanding the eBook Fischer Indole Synthesis
 - The Rise of Digital Reading Fischer Indole Synthesis
 - Advantages of eBooks Over Traditional Books
2. Identifying Fischer Indole Synthesis
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Fischer Indole Synthesis
 - User-Friendly Interface
4. Exploring eBook Recommendations from Fischer Indole Synthesis
 - Personalized Recommendations
 - Fischer Indole Synthesis User Reviews and Ratings
 - Fischer Indole Synthesis and Bestseller Lists

5. Accessing Fischer Indole Synthesis Free and Paid eBooks
 - Fischer Indole Synthesis Public Domain eBooks
 - Fischer Indole Synthesis eBook Subscription Services
 - Fischer Indole Synthesis Budget-Friendly Options
6. Navigating Fischer Indole Synthesis eBook Formats
 - ePub, PDF, MOBI, and More
 - Fischer Indole Synthesis Compatibility with Devices
 - Fischer Indole Synthesis Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Fischer Indole Synthesis
 - Highlighting and Note-Taking Fischer Indole Synthesis
 - Interactive Elements Fischer Indole Synthesis
8. Staying Engaged with Fischer Indole Synthesis
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Fischer Indole Synthesis
9. Balancing eBooks and Physical Books Fischer Indole Synthesis
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Fischer Indole Synthesis
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Fischer Indole Synthesis
 - Setting Reading Goals Fischer Indole Synthesis
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Fischer Indole Synthesis
 - Fact-Checking eBook Content of Fischer Indole Synthesis
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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