

Carl Murray - Atropisomerism And Axial Chirality: Unraveling the Fascinating World of Molecular Structures

Atropisomerism and axial chirality might sound like complex scientific terms, but they represent the key to unlocking the mesmerizing world of molecular structures. Dive into the captivating research of Carl Murray, an esteemed chemist and researcher, as we embark on a journey to understand these intriguing concepts. Prepare to be amazed by the wonders and implications they hold within the realm of chemistry and beyond.

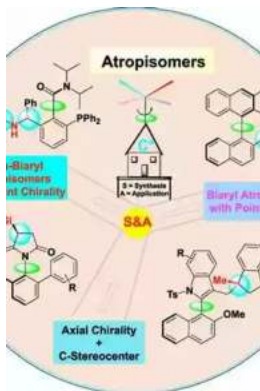
Understanding Atropisomerism - A Twist in Molecular Identity

Atropisomerism refers to a type of stereoisomerism in which molecules can exist in two distinct configurations due to hindered rotation around a single bond. This unique phenomenon arises when a substituent group or functional moiety hinders the free rotation of two adjacent atoms or groups, giving rise to two distinct conformers. These conformers, known as enantiomers, exhibit different spatial arrangements, leading to different physical and chemical properties.

The concept of atropisomerism was first introduced by Paul Karrer in the early 1930s and has since become a fascinating area of study for chemists worldwide. It plays a crucial role in various fields, including drug development, organic synthesis, and material science. Understanding atropisomerism enables scientists to manipulate the properties of molecules, leading to innovative breakthroughs in pharmaceuticals, materials, and molecular electronics.

Atropisomerism And Axial Chirality

by Carl D. Murray(Kindle Edition)



★★★★☆ 4.2 out of 5

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Text-to-Speech : Enabled
Screen Reader : Supported
Enhanced typesetting : Enabled
Print length : 765 pages



Axial Chirality - Unveiling the Importance of 3D Arrangements

Axial chirality is intimately related to atropisomerism, as it involves the hindered rotation around an element of chirality, often an axis. This intricate concept refers to the property possessed by certain molecules that restricts their spatial rotation around an axis due to the presence of substituents or steric hindrance. Unlike conventional chirality, which relies on tetrahedral carbon configurations, axial chirality is determined by the 3D arrangement around an axis.

Carl Murray, a distinguished expert in the field, has made significant contributions to unearthing the diversified aspects of atropisomerism and axial chirality. His extensive research has shed light on the underlying mechanisms governing these phenomena, paving the way for advancements in molecular design, synthesis, and structural elucidation.

The Applications and Implications - From Pharmaceuticals to Materials Science

As mentioned earlier, the significance of atropisomerism and axial chirality can be witnessed in an array of scientific domains. In pharmaceuticals, these concepts offer a unique approach to developing drugs with enhanced activity, higher

selectivity, and reduced side effects. By manipulating the atropisomeric properties of a molecule, researchers can tweak its biological interactions, potentially revolutionizing the treatment of various diseases.

In the realm of material science, atropisomers exhibit intriguing properties that can be harnessed for new materials with tailored characteristics. By controlling the axial chirality of molecules, scientists can precisely tune their physical properties, such as conductivity, luminescence, and thermal stability. This opens up a realm of possibilities for the development of advanced materials for electronics, photonics, and catalysis.

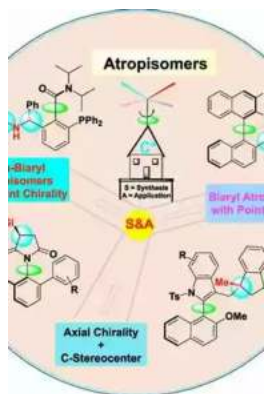
The Groundbreaking Research of Carl Murray

Carl Murray is a prominent figure in the field of atropisomerism and axial chirality. Having dedicated his career to exploring these complex concepts, his groundbreaking research has paved the way for numerous scientific breakthroughs and technological advancements.

Murray's studies have involved investigating the synthesis methods and characterization techniques for controlling atropisomerism and axial chirality. His work has encompassed the structural determination of these unique molecules, development of chiral catalysts, and exploration of the dynamic behavior of atropisomeric systems. Through his interdisciplinary collaborations, Murray has successfully extended the understanding and applications of these fascinating phenomena.

, atropisomerism and axial chirality represent captivating aspects of chemistry that have the potential to transform the scientific landscape. Carl Murray's contributions to unraveling the mysteries surrounding these phenomena have been instrumental in pushing the boundaries of molecular design and synthesis.

As researchers continue to delve deeper into this fascinating realm, the possibilities for groundbreaking discoveries and transformative applications are endless.



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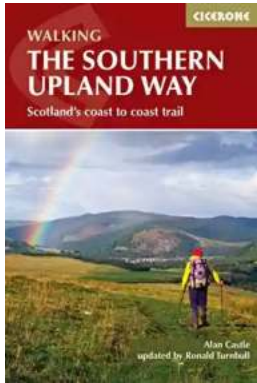
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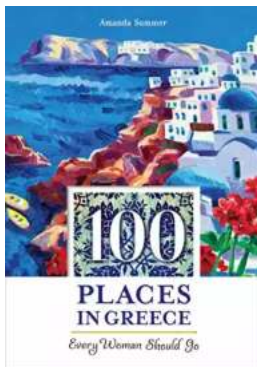


Chapter contribution from Ben Feringa, Nobel Laureate in Chemistry 2016. Atropisomerism and Axial Chirality provides a global survey of the chemistry of axially chiral compounds including biaryls, heterobiaryls, non-biaryl atropisomers, allenes and spirocyclic derivatives. From the perspective of a synthetic organic chemist, this book provides a unique compilation of the available methodologies for their synthesis, with emphasis on the most efficient and modern strategies, a review of the huge amount of practical applications in the field of asymmetric catalysis, either as transition metal ligands or as organocatalysts, and an overview of their occurrence as bioactive compounds and natural products. The first of its kind, this book serves as a general and a practical reference to advanced chemistry students and researchers, while also offering creative ideas for further developments in the field.



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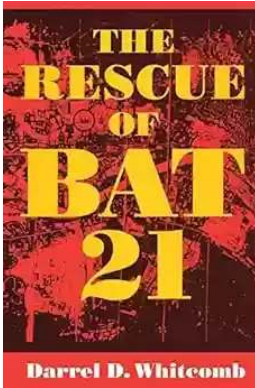
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