Hot Topic: Organocatalysis

Chemistry – A European Journal | Volume 29 | Issue 69 | December 2023

The term organocatalysis describes the acceleration of chemical transformations by small organic molecules. Since the beginning of the 21st century, organocatalysis has developed into a mature field of research, with many applications in academia and industry. This Hot Topic collection highlights recent advances in organocatalysis, including asymmetric organocatalysis, photoorganocatalysis, and organocatalysis in aqueous media, and showcases the versatile nature of organocatalysis, ranging from the double-bond selectivity of the triazol-catalyst and the ethyl-catalyst, to the ...

Further Reading

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Aspac Chem. Int. 12: **2021**, 271-274; Aspac Chem. **2021**, 17, 242
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Aspac Chem. Int. 12: **2021**, 285-289
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Aspac Chem. Int. 12: **2022**, 295-299; Aspac Chem. **2022**, 17, 276
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Aspac Chem. Int. 12: **2022**, 300-304; Aspac Chem. **2022**, 17, 277
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Hot Topic: Organocatalysis

Hot Topic: Organocatalysis

An enantioselective radical-radical coupling using cyanobenzyl-phenylethanol (cyanohydrin) and benzyl-phenylketone (enolate) is described. The reaction is initiated by a photon-induced electron transfer (PIET) of the cyanohydrin to the excited state of the enolate, which generates the corresponding radicals. The reaction proceeds via a bottom-up strategy, which controls the double-bond selectivity of the triazol-catalyst and the ethyl-catalyst, to afford the ...

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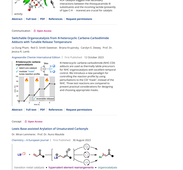
Research Article | Open Access

Autocatalysis and CO2 Carbon Capture and Utilization (CCU) Meets Natural Selection

Gabriel Gordon, Philip Kelly, Prof Paul Dauenhauer, Dr. Marian Kraus, Dr. Jorge A. Sanchez-Delgado

Chemistry – A European Journal | First Published: 16 August 2023



Multi-functional Ruthenium-phosphine complexes have been used in the hydrogenation of CO2 to formic acetone (FA) and formic acetone formate (FAF) in the presence of a base. Autocatalysis has been observed in the hydrogenation of CO2 to FAF, which is a key step in the production of formic acetone carbonate (FAC). In this study, we evaluated a hypothesis that autocatalysis could be the driver for the selection of the most active catalyst, Ru-PNP, ...

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Multi-Functional Diphosphonium Cations for Polymerics Production and Upcycling Depolymerization

Dr. Alex Bishop, Dr. Hongfeng Zhu, Prof. Ryan Wagg, Prof. Kaden Oliver

Chemistry – A European Journal | First Published: 16 August 2023

Multi-functional diphosphonium cations have been synthesized and characterized. Their reactivity towards epoxides and CO2 has been studied. Depending on the substituents, the cations can be used as catalysts for the ring-opening polymerization of epoxides or as catalysts for the formation of cyclic carbonates. The cations can also be used as catalysts for the depolymerization of polycarbonates, polyesters, and polyamides. Depolymerization of polycarbonates and polyesters with the cations ...

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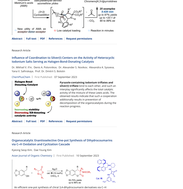
Tailored Ion Pairs Catalyst Discovery Through Iterative Identification of New Cation Motifs and Their Application in Enantioselective Transfer Hydrogenation

Dr. Ilia A. Tikhonov, Julia Gerlach, Jan M. Lehn

Angewandte Chemie International Edition | First Published: 16 August 2023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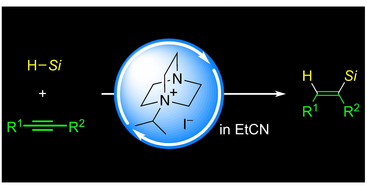
Iterative Identification of New Cation Motifs
Application in Enantioselective Transfer Hydrogenation
Ion Pairs Catalyst
Cation
Anion
Substrate
Product
Cation Motif
Cation Motif
Cation Motif

Quaternary Ammonium Salts: Catalysts for Hydrosilylation of Alkynes with Hydrosilanes

Hiroki Andoh, Kosuke Nakamura, Yusuke Nakazawa, Tomoko Ikeda-Fukazawa, Satoki Okabayashi, Teruhisa Tsuchimoto

Advanced Synthesis & Catalysis | First Published: 18 July 2023



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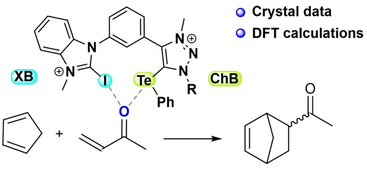
A Combined Halogen- and Chalcogen-Bonding Organocatalyst

Dhananjoy Pal, Tim Steinke, Lukas Vogel, Elric Engelage, Sascha Heinrich, Dana Kutzinski, Stefan M. Huber

Advanced Synthesis & Catalysis | First Published: 26 July 2023



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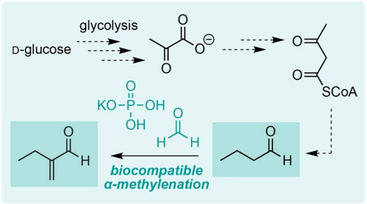
Communication | Open Access

Biocompatible α-Methylenation of Metabolic Butyraldehyde in Living Bacteria

Jonathan A. Dennis, Nick W. Johnson, Thomas W. Thorpe, Stephen Wallace

Angewandte Chemie International Edition | First Published: 21 July 2023



Introducing new abiotic chemistry into living cells is a grand challenge in the field of chemical biotechnology. Here, we show that phosphate and/or biogenic amines mediate the non-enzymatic α-methylenation of butyraldehyde under biocompatible reaction conditions and can be interfaced with butyraldehyde biosynthesis from D-glucose in the bacterium *Escherichia coli*.

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Research Article

Brønsted Acid–Catalyzed Tandem Reaction of 1,4-Enediones with 2-Naphthols: Synthesis of 2-Furylmethylnaphthalenes

Dr. Cong-Hui Gao, Dr. Lei Yu, Dr. Xin-Yue Wu, Dr. Hong-Lin Wan, Prof. Wei Tan, Prof. Feng Shi

Asian Journal of Organic Chemistry | First Published: 31 July 2023

A Brønsted acid-catalyzed tandem reaction of 1,4-enediones with aromatic nucleophiles was developed, affording a series of 2-furylmethylarenes in high yields (up to 98%). The attractive features of this reaction include mild reaction conditions, overall high yields, and water as the only byproduct.

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A Constitutionally Dynamic Cage Acts as a Convertible and Adaptable Information Manager in Supramolecular Logic

Vishnu Verman Rajasekaran, Sohom Kundu, Debabrata Mondal, Prof. Dr. Michael Schmittel

ChemSystemsChem | First Published: 05 July 2023

A three-component molecular ensemble consisting of a constitutionally dynamic cage, a rotaxane and a luminophore acts as a signal transducer which assimilates three input signals, i. e., Zn^{2+}, H^+, and Cu^+, to perform two individual logic operations.

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Minireview | Full Access

Design and Application of Peptide-Mimic Phosphonium Salt Catalysts in Asymmetric Synthesis

Dr. Siqiang Fang, Zanjiao Liu, Tianli Wang

Angewandte Chemie International Edition | First Published: 05 July 2023

Peptide-mimic phosphonium salt catalysts, a judicious combination of ion-pair elements with peptide scaffolds that bear multiple hydrogen-bonding donors, have captivated considerable attention for their unprecedented performance in a plethora of enantioselective transformations, in many cases enabling never-before-seen patterns of reactivity and selectivity. In this context, we provide a succinct overview of recent progress in this field.

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Diastereo- and Enantioselective Organocatalytic Synthesis of Spirocyclopropyl Pyrazolones

Laura Carceller-Ferrer, Gonzalo Blay, M. Carmen Muñoz, José R. Pedro, Carlos Vila

Advanced Synthesis & Catalysis | First Published: 15 June 2023

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Chiral Phosphoric Acid-Catalyzed Enantioselective Synthesis of Axially Chiral Compounds Involving Indole Derivatives

Dr. Jun Kee Cheng, Prof. Bin Tan

The Chemical Record | First Published: 26 June 2023

Indoles serve as versatile building blocks in constructing various axially chiral scaffolds in the presence of chiral phosphoric acid catalysts. The transformations are enabled by tunability of both indole substrates and catalysts for high chemo-, regio- and atroposelectivities.

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Review

Organocatalytic (1+4)-Annulations of MBH Adducts with Electron-Deficient Systems

Dr. Xuling Chen, Prof. Dr. Pengfei Li

The Chemical Record | First Published: 09 June 2023

Recent advances in organocatalytic (1+4)-annulations of MBH adducts with four-atom synthons has been summarised for the construction of functionalized five-membered carbo- and heterocycles.

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