

Abstracts

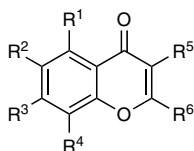
2019

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14.4.12 4*H*-1-Benzopyran-4-ones

X. Dong and H. Liu

This chapter is an update to the earlier *Science of Synthesis* contribution (Section 14.4.3) describing methods for the synthesis of 4*H*-1-benzopyran-4-ones. It focuses on the literature published in the period 2004–2018, with most methods involving cyclization to form the oxygen-containing ring.



Keywords: 4*H*-1-benzopyran-4-ones · 4*H*-chromen-4-ones · ring closure · annulation · ring enlargement · condensation · aromatization

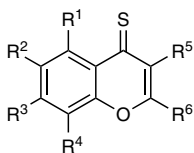
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14.4.13 4*H*-1-Benzopyran-4-thiones

X. Dong and H. Liu

This chapter is an update to the earlier *Science of Synthesis* contribution (Section 14.4.4) describing methods for the synthesis of 4*H*-1-benzopyran-4-thiones. It focuses on the literature published in the period 2004–2018. All methods covered involve the thionation (replacement of the oxygen of a carbonyl group by sulfur) of the corresponding 4*H*-1-benzopyran-4-ones, either isolated or generated in situ.



Keywords: 4*H*-1-benzopyran-4-thiones · 4*H*-chromene-4-thiones · 4*H*-1-benzopyran-4-ones · thionation · Lawesson's reagent · phosphorus pentasulfide · thiophosphoryl chloride

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Updated Section ·

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Completely Revised Contributions ·

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New Contributions

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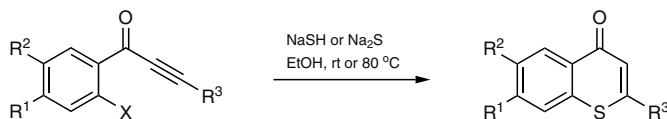
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14.9.6

Benzothiopyranones and Benzothiopyranthiones

C.-F. Lee

This chapter is an update to the earlier *Science of Synthesis* contribution (Section 14.9) describing methods for the synthesis of benzothiopyranones (thiochromenones), benzothiopyranthiones (thiochromenethiones), and related compounds such as 9*H*-thioxanthen-9-ones and 9*H*-thioxanthen-9-thiones. General routes to benzothiopyranones involve the intramolecular cyclization of aryl-substituted enones or ynones in the presence of sodium sulfide, and more recent developments with alternative approaches are included herein.



X = Br, OMe

Keywords: benzothiopyranones · thiochromenones · thiocoumarins · thiochromenethiones · thioisochromenones · thioisocoumarins · thioisochromenethiones · benzothiopyranthiones · 9*H*-thioxanthen-9-ones · 9*H*-thioxanthen-9-thiones · annulation · substituent modification · C–S bond formation

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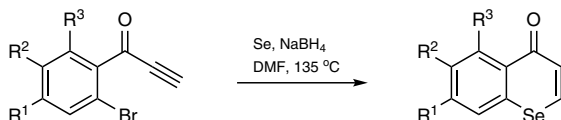
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14.11.3

Selenopyranones and Benzoselenopyranones

C. Chen and L. Yu

This chapter is an update to the earlier *Science of Synthesis* contribution (Section 14.11) describing methods for the synthesis of selenopyranones and benzoselenopyranones. Recent interest in this area has in part been generated by the discovery that some 9*H*-selenoxanthen-9-ones and selenopyran in particular, exhibit very good absorption of near-infrared light, which means they have potential applications in many fields such as medicine, sensors/detectors, and catalysis.



Keywords: selenopyranones · benzoselenopyranones · selenium · cyclization · ring-closure reactions · C–H arylation · photosensitizers

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New Contributions

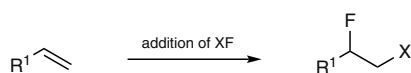
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34.1.5 **Synthesis of Fluoroalkanes by Addition Reactions to Alkenes**

G. Haufe

This review describes methods for the synthesis of fluoroalkanes and a variety of substituted analogues from alkenes. In addition to well-established and newer examples of hydro-, halo-, nitro-, sulfanyl-, and selenylfluorination reactions of alkenes, recent methods for the fluorophosphorylation, fluorosulfonylation, carbofluorination, and oxyfluorination of double-bond systems are also described.



X = H, Cl, Br, I, NO₂, N₃, SR², SO₂R², SeR², CR²₃, OR², P(O)(OR²)₂

Keywords: fluoroalkanes · alkenes · alkyl halides · alkyl fluorides · asymmetric synthesis · bromofluorination · carbocyclization · carbon–halogen bonds · electrophilic addition · fluorination · fluorine compounds · halolactonization · radical reactions · ring closure · selenylation · sulfenylation · sulfonylation

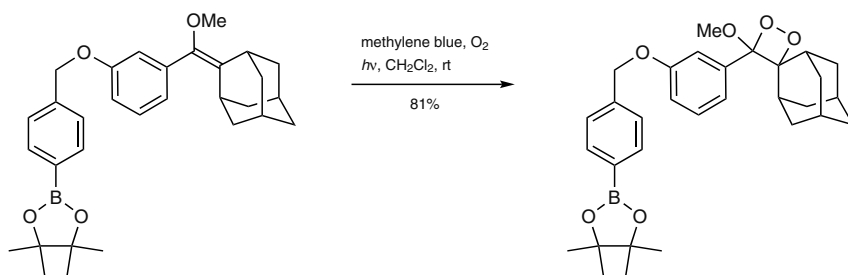
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38.8.2.2 **Medicinal Chemistry of Stable and Unstable 1,2-Dioxetanes: Origin, Formation, and Biological Activities**

V. M. Dembitsky and V. A. Vil'

This chapter describes the formation and transformation of stable and unstable 1,2-dioxetanes in various metabolic pathways. The chapter also describes the modern approaches to the synthesis of compounds with 1,2-dioxetane moiety, including molecules with chemiluminescence properties.



Keywords: 1,2-dioxetanes · peroxides · hydroperoxides · oxidation · singlet oxygen · cholesterol derivatives · vitamins · unsaturated compounds · oxidative cleavage · chemiluminescence

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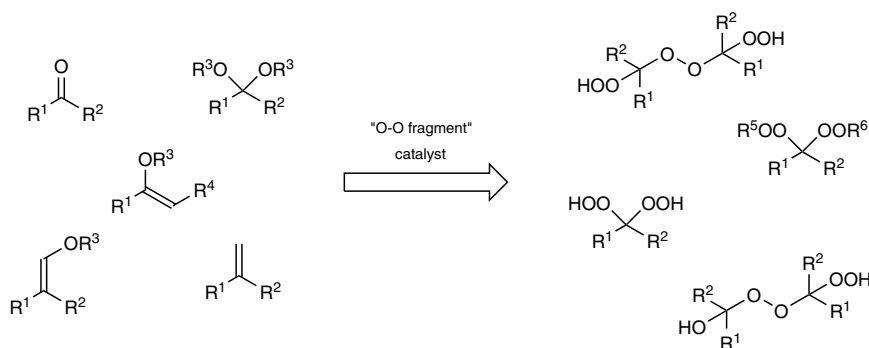
New Contributions

38.11

Acyclic Geminal Bisperoxides

V. A. Vil', O. V. Bityukov, and A. O. Terent'ev

This chapter describes synthetic approaches to geminal noncyclic bisperoxides such as geminal bishydroperoxides, geminal bisperoxides, bis(1-hydroperoxyalkyl) peroxides, and 1-hydroperoxyalkyl 1-hydroxyalkyl peroxides. Classical approaches to the preparation of geminal bisperoxides are based on Lewis or Brønsted acid catalyzed peroxidation of carbonyl compounds and alkenes by hydrogen peroxide or hydroperoxides. The chapter also describes other, more specific approaches to the synthesis of compounds with geminal bisperoxide moieties.



Keywords: peroxides · hydroperoxides · oxidation · carbonyl compounds · ketones · ketals · enol ethers · aldehydes · alkenes · acid catalysis · ozonolysis