

Science of Synthesis

Full-text resource for methods in synthetic organic chemistry

Best methods. Best results.



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Science of Synthesis

Science of Synthesis provides a critical review of the synthetic methodology developed from the early 1800s to-date for the entire field of organic and organometallic chemistry.

Authoritative full-text descriptions and experimental procedures

As the only resource providing full-text descriptions of organic transformations and synthetic methods as well as experimental procedures, Science of Synthesis is a unique chemical information tool. Its insightful, didactic reviews by experts add real value to your online reference collection.

Easily accessible and searchable

Science of Synthesis is easily accessible via a modern Web interface at sos.thieme.com. The intuitive search function allows rapid lead generation and route optimization. Search results are illustrated with detailed reaction schemes and can be saved in a MySoS account [MySoS](#), as well as personal settings and search queries. All chapters can be printed and downloaded as PDFs.

Methods selected, reviewed and continually updated by 1,750 experts

World-renowned experts have chosen the most important molecular transformations for a class of organic compounds and elaborated on their scope and limitations. They update the content regularly with new information and special topics of particular interest to the synthetic chemist.

Logically organized by functional group

The systematic, logical and consistent organization of the synthetic methods for each functional group enables users to quickly find out which methods are useful for a particular synthesis and which are not.

Immediately applicable in the lab

Effective and practical experimental procedures can also be implemented quickly and easily in the lab. This enables the chemist to get started immediately with the design and planning of a synthesis.

Highlighting special topics

In addition, Science of Synthesis features the best methods in special fields of importance in organic synthesis (also called the Reference Library). All special topics are part of the Science of Synthesis series. The content is fully integrated with the main series and included in the license fee without further costs.

Topics	Volume Editors
Stereoselective Synthesis	Johannes G. de Vries Gary A. Molander P. Andrew Evans
Water in Organic Synthesis	Shū Kobayashi
Asymmetric Organocatalysis	Benjamin List Keiji Maruoka
Cross Coupling and Heck-Type Reactions	Gary A. Molander John P. Wolfe Mats Larhed
C-1 Building Blocks in Organic Synthesis	Piet van Leeuwen
Multicomponent Reactions	Thomas J. J. Müller
Biocatalysis in Organic Synthesis	Kurt Faber Wolf-Dieter Fessner Nicholas Turner
Catalytic Transformations via C–H Activation	Jin-Quan Yu
Applications of Domino Transformations in Organic Synthesis	Scott Snyder
Metal-Catalyzed Cyclization Reactions	Shengming Ma Shuanhu Gao

The screenshot shows the Science of Synthesis website interface. At the top, there is a navigation bar with 'Home', 'Query', 'Results', 'Full text', and 'Explore contents'. Below this, the breadcrumb trail reads 'Organometals > Organometals >'. The main content area is titled '3.6.13.1 Gold-Catalyzed Coupling Reactions' with a DOI of 10.1055/sos-SD-103-00039. The author is listed as 'Hopkinson, M. N.; Gouverneur, V., Science of Synthesis Knowledge Updates, (2011) 2, 101.' The text begins with a 'General Introduction' section, discussing the importance of homo- and cross-coupling reactions catalyzed by transition metals. It mentions the 2010 Nobel Prize in Chemistry and the use of gold complexes as catalysts. A 'SAFETY' note at the bottom of the page states: 'Gold complexes are generally mild irritants and care should be taken to avoid contact with eyes or skin, or inhalation of dust particles. Gold(I) chloride and tetrachloroauric acid (HAuCl₄) cause burns and may cause sensitization by skin contact.'

Including the Houben-Weyl archive

In addition, Science of Synthesis includes a backfile with the complete Houben-Weyl series, published between 1909 and 2003 and including reference citations back to the 1800s. The backfile documents are available in PDF format and their tables of contents are text searchable.

Each chapter begins with a general introduction to a certain compound class. The rest of the chapter goes on to illustrate the best methods (including variations) of synthesis for the specified class.

The login to MySoS enables you to save personal settings, search queries and manually revised hitlists of results.

The modern interface

A clear, browser-based interface gives easy access to the methods and experimental procedures in Science of Synthesis.

The intuitive search functionality allows you to quickly enter a structure or term and provides a comprehensive hitlist including illustrating schemes.

The powerful and user-friendly structure search has been developed in cooperation with InfoChem.



Query

To start a search simply enter a text search term and/or structure with the HTML5 drawing tool or ChemDraw. You can also upload Molfiles.

By clicking on the info button **i** you get further information on how to carry out advanced text searches.

Results

The hitlist of results is ranked by relevance or can alternatively be sorted by publication date. It shows the title, bibliographic data and optionally the reaction scheme.

Each hit is linked to the full text, to the context of a method and to the single-step reactions.

Filtering options include: Reactant, Catalyst, Product (for structure search), Title, Content, References (for text search)

Thieme Science of Synthesis

Home Query Results Full Text Explore Contents

MySOS

FUNCTIONS
Collapse Tree

Explore Contents

- Science of Synthesis
 - Organometallics
 - Ni, Pd, Pt, Co, Rh, Ir, Fe, Ru, and Os Compounds (Groups 10-8) (Vol. 1)
 - Mn..., Cr..., V..., Ti..., Sc..., Lanthanide, and Actinide Compounds (Groups 7-3) (Vol. 2)
 - Zn, Cd, Hg, Cu, Ag, and Au Compounds (Groups 12 and 11) (Vol. 3)
 - Organometallic Complexes of Zinc
 - Organometallic Complexes of Cadmium
 - Organometallic Complexes of Mercury
 - Organometallic Complexes of Copper
 - Organometallic Complexes of Silver
 - Organometallic Complexes of Gold
 - Unsubstituted Alkylgold(I) and Alkylgold(III) Compounds
 - Organogold Compounds with Substituted Alkyl Ligands
 - Organogold Compounds with Ylide Ligands
 - Organogold Compounds with Alkenyl Ligands
 - Organogold Compounds with Alkynyl Ligands
 - Arylgold Compounds
 - Heterocycles as Ligands for Gold(I) and Gold(III) Complexes
 - Carbene Complexes of Gold
 - Alkene and Alkyne n-Complexes of Gold(I)
 - Carbon in Gold Clusters
 - Organometallic Complexes of Gold (Update 1, 2011)
 - Organometallic Complexes of Gold (Update 2, 2011)
 - Organometallic Complexes of Gold (Update 3, 2011)
 - Gold-Catalyzed Coupling Reactions
 - Oxidative Coupling with Gold(III) as a Stoichiometric Oxidant
 - Gold-Catalyzed Cross Coupling with Substrates as Oxidants
 - Gold-Catalyzed Oxidative Homocoupling with External Oxidants
 - Homocoupling of Nonactivated Arenes Using (Diacetoxyiodo)benzene
 - Synthesis of Dicomarins via Cyclization-Homocoupling Using tert-Butyl Hydroperoxide
 - Cyclization-Homocoupling of 2-Alkynylphenols with (Diacetoxyiodo)benzene
 - Homocoupling of Propargyl Acetates Using Selectfluor
 - Homocoupling from Stoichiometric Organogold(I) Complexes Using Electrophilic Fluorination
 - Gold-Catalyzed Oxidative Cross Coupling with External Oxidants
- Silicon Compounds and As, Sb, Bi Compounds (Group 15) (Vol. 4)
- Ge, Sn, and Pb Compounds (Group 14) (Vol. 5)
- Boron Compounds (Vol. 6)
- Al, Ga, In, Tl, and Be...Ba Compounds (Groups 13 and 2) (Vol. 7)
- Li, Na, K, Rb, and Cs Compounds (Group 1) (Vol. 8)
- Metarenes
 - Compounds with Four and Three Carbon-Heteroatom Bonds
 - Compounds with Two Carbon-Heteroatom Bonds
 - Compounds with One Carbon-Heteroatom Bond
 - Hydrocarbons
- Special Topics
 - Asymmetric Organocatalysis
 - Biocatalysis in Organic Synthesis
 - C-1 Building Blocks in Organic Synthesis

Explore contents

All methods are organized in a logical structure based on the functional group to be synthesized and can be explored in the context of other methods.

The "Explore contents" function gives a concise overview of the field of organic chemistry and offers a systematic approach to the most reliable synthetic methods.

This makes the reference work an excellent teaching, learning and consulting tool.


Within the table of contents, each chapter can be downloaded and printed as a PDF.

Full text and experimental procedures

Science of Synthesis is the only resource available containing methods with full-text reviews by experts, experimental procedures and accurate, well-drawn and detailed reaction schemes.

The navigation path and the links to previous and next pages at the top allow easy browsing of methods and their context.

All methods and chapters can be easily printed by clicking the print button.

The citation export  allows you to easily cite Science of Synthesis articles (available in RIS, RefWorks, BibTex and plain text format).

Direct outbound links from referenced citations to the original literature and cross-references to related Science of Synthesis and Houben-Weyl methods are also included.

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Home Query Results Full Text Explore contents

MySOS

Organometallics > Organometallics > Gold-Catalyzed > Gold-Catalyzed > ...

NAVIGATION
Hit 3 of 4
Previous / Next

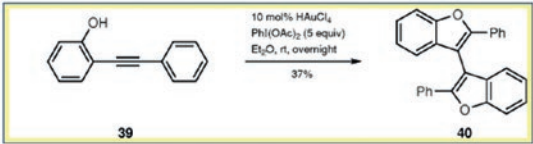
3.6.13.1.3.3 Method 3: Cyclization-Homocoupling of 2-Alkynylphenols with (Diacetoxyiodo)benzene

DOI: 10.1055/sos-SD-103-00054

Hopkinson, M. N.; Gouverneur, V., *Science of Synthesis Knowledge Updates*, (2011) 2, 118.

A similar gold(III)-catalyzed cascade cyclization-homocoupling protocol can be applied in the synthesis of 3,3'-bibenzofurans directly from 2-alkynylphenols (Scheme 17).^[69] In this case, (diacetoxyiodo)benzene is the most successful oxidant, delivering the dimer **40** in 37% yield from phenol **39** when used with tetrachloroauric acid (10 mol%) in diethyl ether. The low isolated yield of the reaction can be attributed to competitive oxidation of the starting material to quinone derivatives by (diacetoxyiodo)benzene.

Scheme 17 Synthesis of a 3,3'-Bibenzofuran from a 2-Alkynylphenol^[69]



2,2'-Diphenyl-3,3'-bibenzofuran (40); Typical Procedure:^[69]

HAuCl₄ (17.5 mg, 0.05 mmol, 10 mol%) was placed in a predried 20-mL vial equipped with a stirrer bar. Et₂O (10 mL) was added and the mixture was stirred at rt for 5 min. 2-Alkynylphenol **39** (100 mg, 0.5 mmol, 1 equiv) was added, followed, after 5 min, by PhI(OAc)₂ (848 mg, 2.6 mmol, 5 equiv). The mixture was stirred at rt overnight and then filtered and concentrated. The crude product was purified by flash column chromatography (silica gel) or preparative TLC.

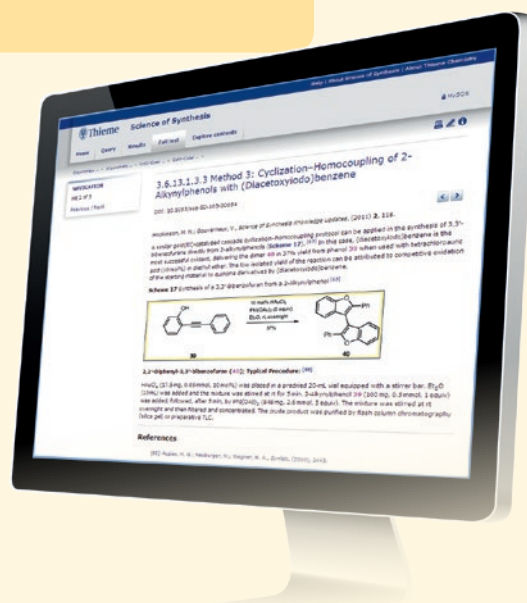
References

[69] Auzias, M. G.; Neuberger, M.; Wegner, H. A., *Synlett*, (2010), 2443.

Why use Science of Synthesis?

Science of Synthesis helps you get up to speed on a chosen field of research quickly and complete the design of your synthetic strategy. It helps you answer questions such as:

- What is the best synthetic strategy to use?
- Which experts work in this field?
- What is the background and context to the field of research I am interested in?
- Which experimental procedures should I use?
- What should I avoid based on the experience of other chemists working in the field?



Recommended by leading experts



“Science of Synthesis is an indispensable tome of chemical information organized in an intuitive and logical way. It contains information on nearly every aspect of chemical reactivity and, for me, is the “go-to” resource for rapidly learning about a new area. I use it regularly in preparation for classes and for consulting visits – it simply gives me the information I need far more easily than any search engine is capable of – and very often contains references and insight that cannot be found anywhere else.”

Prof. Phil S. Baran
The Scripps Research Institute
La Jolla, CA, USA



“Today, we have a flood of chemical information from Web sites as well as various search engines. However, it is always extremely difficult to find what is most important and essential for your research project. Also, it’s sometimes difficult to find a good method to get started with for a first attempt. Science of Synthesis provides you with information that you could never obtain from other sources which is always appropriate and reliable. I strongly recommend that you consult Science of Synthesis whenever you plan an organic synthesis that you are having difficulty with in your research project. I promise you that Science of Synthesis will provide all of the key knowledge without any of the unnecessary information.”

Prof. Hisashi Yamamoto
Chubu University
Japan



“As a past author and current volume editor, I completely appreciate the scientific and editorial rigor to put together the Science of Synthesis. It has the most authoritative and updated reviews and compilation of experimental procedures. Science of Synthesis is the first place I would look before embarking on a synthesis.”

Prof. Jie Jack Li
University of San Francisco
San Francisco, CA, USA



“The phenomenal success of organic chemists in devising new reactions has made it increasingly difficult to find the best procedures and protocols. Science of Synthesis gives leading scientists the opportunity to bring clarity to their respective fields and provides state of the art protocols to the most important organic reactions.”

Prof. Jeffrey Bode
ETH Zurich
Switzerland

Best methods. Best results.



