<table>
<thead>
<tr>
<th>Structure</th>
<th>Structure/Compound Data</th>
<th>N° of preparations</th>
<th>Available Data</th>
<th>N° of ref.</th>
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</table>
| ![Structure](image) | Chemical Name: (Z)-5-hydroxy-3-hexen-2-one  
Reaxys Registry Number: 4951461  
CAS Registry Number: 121288-93-5  
Type of Substance: acyclic  
Molecular Formula: C₇H₁₀O₂  
Linear Structure Formula: C₇H₁₀O₂  
Molecular Weight: 114.144  
InChI Key: BHL0MPMLNMQZVARJAWSKDSA-N  
No of References: 6  
No of Preparations: 5  
No of Reactions: 5  
Identification  
Spectra (2)  
N° of ref: 3 | 5 | Identification  
Spectra (2) | 3 |
| ![Structure](image) | Chemical Name: 5-hydroxy-hex-3-en-2-one  
Reaxys Registry Number: 1902985  
CAS Registry Number: 89488-42-9  
Type of Substance: acyclic  
Molecular Formula: C₇H₁₀O₂  
Linear Structure Formula: C₇H₁₀O₂  
Molecular Weight: 114.144  
InChI Key: BHL0MPMLNMQZVARJAWSKDSA-N  
No of References: 4  
No of Preparations: 4  
No of Reactions: 4  
Identification  
Physical Data (3)  
Spectra (1) | 4 | Identification  
Physical Data (3)  
Spectra (1) | 2 |
| ![Structure](image) | Chemical Name: 5-hydroxy-hex-3-en-2-one  
Reaxys Registry Number: 6693461  
CAS Registry Number: 57204-67-8  
Type of Substance: acyclic  
Molecular Formula: C₇H₁₀O₂  
Linear Structure Formula: C₇H₁₀O₂  
Molecular Weight: 114.144  
InChI Key: BHL0MPMLNMQZVARJAWSKDSA-N  
No of References: 16  
No of Preparations: 1  
No of Reactions: 1  
Identification | 1 | Identification  
Spectra (1) | 2 |
| ![Structure](image) | Chemical Name: 2-hydroxy-5-oxo-hex-2→4-enyl  
Reaxys Registry Number: 1623176  
CAS Registry Number: 89870-45-7  
Type of Substance: acyclic  
Molecular Formula: C₇H₁₀O₂  
Linear Structure Formula: C₇H₁₀O₂  
Molecular Weight: 114.144  
InChI Key: BHL0MPMLNMQZVARJAWSKDSA-N  
No of References: 1  
No of Preparations: 1  
No of Reactions: 1  
Physical Data (1)  
Spectra (1) | 1 | Physical Data (1)  
Spectra (1) | 1 |
### Chemical Names and Synonyms

5-hydroxy-hex-3-en-2-one

### Identification

#### Substance Label (1)

<table>
<thead>
<tr>
<th>Label</th>
<th>Reference</th>
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</table>
| 3     | Adam, Waldemar; Saha-Moeller, Chantu R.; Schmid, Katharina S.  

### Physical Data

#### Boiling Point (1)

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>Pressure</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 68 - 69 °C    | 1 Torr   | Tishchenko, I.G.; Stanishevskii, L.S.  

#### Refractive Index (1)

<table>
<thead>
<tr>
<th>Refractive Index</th>
<th>Wavelength</th>
<th>Temperature</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 1.4585          | 589 nm     | 20 °C       | Tishchenko, I.G.; Stanishevskii, L.S.  

#### Density (1)

<table>
<thead>
<tr>
<th>Density</th>
<th>Reference Temperature</th>
<th>Measurement Temperature</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 0.9931 g cm⁻³ | 4 °C                    | 20 °C                  | Tishchenko, I.G.; Stanishevskii, L.S.  

### Spectra

#### IR Spectroscopy (1)

<table>
<thead>
<tr>
<th>Description</th>
<th>Reference</th>
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</table>
| Spectrum    | Tishchenko, I.G.; Stanishevskii, L.S.  
The document

Author: Adam
Journal: Journal of Organic Chemistry
Volume: 66
Publication Year: 2001
Issue: 2
Pages: 7365
CODEN: JOCEAH
ISSN: 0022-3263
DOI: 10.1021/jo0010549w

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Synthesis of 4,6-Dideoxyfuranoses through the Regioselective and Diastereoselective Oxyfunctionalization of a Dimethylphenylsilyl-Substituted Chiral Homoallylic Alcohol

Waldemar Adam, * Chantu R. Saha-Möller, and Katharina S. Schmid
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DOI: 10.1021/jo010549w
Publication Date (Web): September 29, 2001
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Abstract

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Oxidative Desilylation

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Chantu R. Saha-Möller
Katharina S. Schmid
Synthesis of 4,6-Dideoxycylumoses through the Regioselective and Diastereoselective Oxyfunctionalization of a Dimethylphenylsilyl-Substituted Chiral Homoallylic Alcohol

Waldemar Adam,* Chantu R. Saha-Möller, and Katharina S. Schmid
Institut für Organische Chemie, Universität Würzburg, Am Hubland, D-97074 Würzburg, Germany

Received May 30, 2001

The 4,6-dideoxyfuranoses 10a and 10b have been synthesized by starting from the readily available E-5-dimethylphenylsilyl-2-hexene-4-ol (1) and employing successively three versatile oxyfunctionalization methods, namely photooxygenation, metal-catalyzed epoxidation, and oxidative desilylation. Photooxygenation of the hydroxy vinylsilane 1 and subsequent triphenylphosphine reduction of the hydroperoxides 3 afford the like 4a and unlike 4b diols, which have been converted separately to the tetrahydrofurans (2S*,3R*,5R*)-7a and (2S*,3R*,5S*)-7b by a combination of diastereoselective epoxidation and regioselective intramolecular epoxide-ring opening. In the epoxidation reaction, catalyzed by Ti(Oi-Pr)₄ or VO(acac)₂, only one diastereomer (dr > 95:5) of the epoxide 5 is obtained. Further intramolecular opening of the epoxide ring in erythro 5 occurs regioselectively at the C-α position and diastereoselectively under inversion of the configuration of the silyl-substituted stereogenic center to generate only one diastereomer of the tetrasubstituted tetrahydrofurans 7. Oxidative desilylation of the latter gave the hitherto unknown 4,6-dideoxyfuranoses 10a and 10b. The use of the optically active E-5-dimethylphenylsilyl-2-hexene-4-ol (1) as starting material, which is readily available through lipase-catalyzed kinetic resolution, leads to the α- and β-4,6-dideoxysorbofuranoses 10a and β- and α-4,6-dideoxyfructofuranoses 10b in up to 98% enantiomeric excess.

Introduction

While monodeoxy sugars are present in a wide variety of natural products, relatively little is known about dideoxy sugars, in particular, the 4,6-dideoxyhexoses. Such dideoxy sugars, e.g., the 4,6-dideoxyhexose chalcoso (see structures), are found as structural units in bioactive compounds.

In past years, we have intensively studied the selective oxyfunctionalization of chiral allylic alcohols to the corresponding epoxy diols by photooxidation and direct titanium-catalyzed epoxidation. Alternatively, the intermediary allylic hydroperoxides of the photooxidation were reduced by triphenylphosphine and subsequently the resulting alkene diols were epoxidized under Ti(Oi-Pr)₄ catalysis with β-hydroxy hydroperoxides as oxygen donors. Here we report that by employing this methodology, the hitherto unknown 4,6-dideoxyfuranoses 10 may be prepared stereoselectively from the dimethylphenylsilyl-substituted chiral homoallylic alcohol 1 (Scheme 1). Most gratifying, also the optically active 4,6-dideoxsorbofuranoses 10a and 4,6-dideoxyfructose 10b derivatives have been now made available for the first time by starting from the enantiomerically enriched...
and/or enter an advanced factual query:
12 reactions out of 6 citations

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- Reaction Type
- No. of Steps
- Product Availability
- Reactant/Availability
- Availability in other DBs
- Document Type
- Authors
- Patent Assignee
- Journal Title
- Publication Year

Reactions

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<th>Yield</th>
<th>Conditions</th>
<th>References</th>
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<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B: 90%  
With oxygen; 5, 15, 20-tetraphenylporphyrin in dichloromethane  
T = 15 °C; 12 h; Irradiation;

Adam. Waldemar; Saha-Moeller, Chantu R.; Schmid, Katharina S.;  

Title/Abstract  Full Text  View citing articles
Show Details
**Reaction 1:**

- **Condition:** Synthesize
- **Yield:** 90%
- **Reagents:** Oxygen; 5,15,10,20-tetraphenylporphyrin in dichloromethane
- **Temperature:** T=15°C, 12 h; Irradiation

**References:**

Adam, Waldemar; Saha-Moeller, Chantu R.; Schmid, Katharina S.
Title/Abstract Full Text View citing articles

**Reaction 2:**

- **Condition:** Synthesize
- **Reagents:** (salen)Co(II) in dichloromethane
- **Temperature:** T=20°C, Isomerization; 5 h; Title compound not separated from byproducts

**References:**

Avery, Thomas D.; Taylor, Dennis K.; Tiekink, Edward R. T.
Title/Abstract Full Text View citing articles

**Reaction 3:**

- **Condition:** Synthesize
- **Yield:** 90%

**References:**

Adam, Waldemar; Saha-Moeller, Chantu R.; Schmid, Katharina S.
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