

This article was downloaded by:

On: 28 January 2011

Access details: Access Details: Free Access

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618290>

Preparation and Reactions of 2-Oxa-6-thiabicyclo[3.2.0]-heptanes and 2-Oxa-5-thiabicyclo[2.2.1]heptanes from Pentoses

Jürgen Voss; Oliver Schulze; Falk Olbrich; Gunadi Adiwidjaja

To cite this Article Voss, Jürgen , Schulze, Oliver , Olbrich, Falk and Adiwidjaja, Gunadi(1997) 'Preparation and Reactions of 2-Oxa-6-thiabicyclo[3.2.0]-heptanes and 2-Oxa-5-thiabicyclo[2.2.1]heptanes from Pentoses', Phosphorus, Sulfur, and Silicon and the Related Elements, 120: 1, 389 — 390

To link to this Article: DOI: 10.1080/10426509708545562

URL: <http://dx.doi.org/10.1080/10426509708545562>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

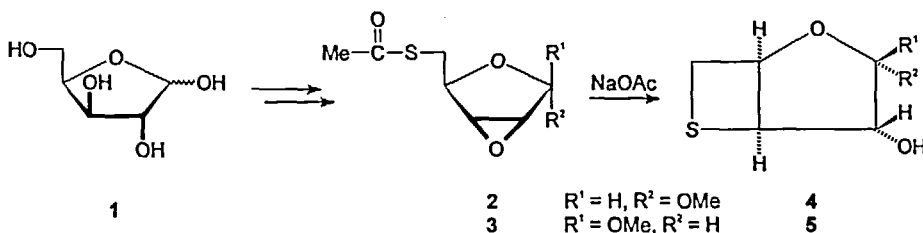
Preparation and Reactions of 2-Oxa-6-thiabicyclo[3.2.0]-heptanes and 2-Oxa-5-thiabicyclo[2.2.1]heptanes from Pentoses

JÜRGEN VOSS*, OLIVER SCHULZE, FALK OLBRICH, GUNADI ADIWIDJAJA

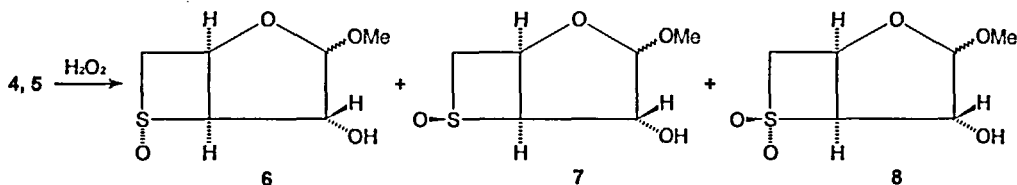
*Institute of Organic Chemistry, University of Hamburg,
 Martin-Luther-King-Platz 6, D-20146 Hamburg, Germany.*

Abstract: The preparation of the two diastereoisomeric 3-methoxy-2-oxa-6-thiabicyclo-[3.2.0]heptan-4-ols **4** and **5** from D-xylose **1** via methyl 2,3-anhydro- α -D-ribofuranoside and the corresponding β -anomer is described. Oxidation of **4** and **5** yields the sulfoxides **6** and **7** and the sulfones **8**. – On the other hand, the two diastereoisomeric 3-methoxybicyclo[2.2.1]heptan-7-ols **11** and **12** are obtained from methyl 5-acetylthio-5-deoxy-2-O-mesyl-D-xylofuranosides **9** and **10** via Mitsunobu reaction and intramolecular cyclization. – The stereoisomeric counterparts of **4** and **5**, **13** and **14**, are obtained in only four steps from L-arabinose.

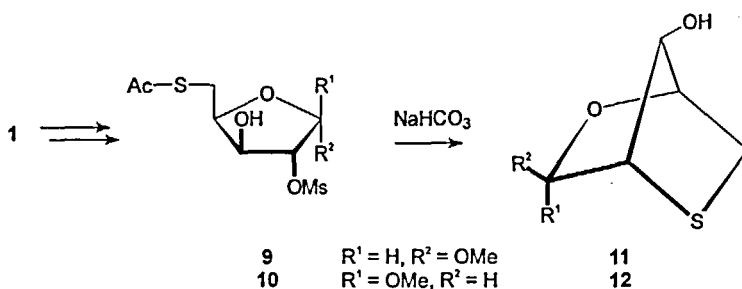
Starting from D-xylose **1** the two oxathiabicyclo[3.2.0]heptan-4-ols **4** and **5** were prepared in a multistep synthesis via Mitsunobu reaction and intramolecular cyclization of the thioacetates **2** and **3**. The two bicyclic compounds were obtained with good overall-yields as pure crystalline diastereoisomers. The structures of **4** and **5** were established by NMR spectroscopic methods and confirmed by X-ray structural analyses. The thietane ring of the β -isomer **5** turned out to be very flat (2.9°) whereas in the α -isomer **4** the angle was 16.5° .



Oxidation of **4** and **5** with hydrogen peroxide yielded the corresponding sulfoxides **6** and **7** as well as the sulfones **8**. The β -isomer of **8** exhibits a nearly planar thietane S,S-dioxide ring (2.0°) according to an X-ray structural analysis.



In a different way but using again the Mitsunobu reaction and cyclization of the thioacetates **9** and **10** we obtained the isomeric 2-oxa-5-thiabicyclo[2.2.1]heptan-7-ols **11** and **12** from the same precursor D-xylose **1**.



Starting from inexpensive L-arabinose it is also possible to prepare in only four steps two further diastereomeric 2-oxa-6-thiabicyclo[3.2.0]heptan-4-ol derivatives, the mesylates **13** and **14**. Once more, the Mitsunobu and the intramolecular cyclization reaction are applied.

